OBSTETRICAL AND GYNECOLOGICAL NUMBER

THE JOURNAL OF THE AMERICAN OSTEOPATHIC ASSOCIATION

Vol. 49, No. 11 | 212 E. Ohio St., Chicago 11, Ill. | July, 1950

The Osteopathic Progress Fund

Is Dedicated to

Progress in Osteopathic Education and Research

The National Goal	**$7,553,000.00**
Amount Pledged	**$3,814,166.84**
Amount Paid	**$1,798,577.63**
Per Cent of Quota Pledged	**51%**

New (2nd) Edition **JANNEY'S MEDICAL GYNECOLOGY**

This is the book—now in a *New (2nd) Edition*—that emphasizes the socio-medical aspects of gynecology. It explains your role—as both physician and counselor—in helping patients on such problems as: preparation for marriage; marital maladjustments; fertility and sterility; artificial insemination; etc. Your function here is a vitally important one, and there is little reference material available elsewhere on the subject.

Dr. Janney's volume does much more, of course, than help you on socio-medical problems. Among the scores of other appealing features of the book are these:

a. It tells you how to take a really useful history—what questions to ask, how to elicit significant information, how to requestion a patient when you know the answer given you is false.

b. It explains, step-by-step, how to make a thorough and informative physical examination.

c. It approaches all disorders from the point of view of *the patient's complaints*, and includes many "thumbnail summaries" to facilitate your diagnosis.

d. The *New (2nd) Edition* gives all the new treatments.

By James C. Janney, M.D., F.A.C.S., Associate Professor of Gynecology, Boston University School of Medicine. 454 pages, 6"x9½", illustrated. $6.50. *New (2nd) Edition.*

W. B. SAUNDERS COMPANY • West Washington Square, Philadelphia 5

For the colic, diarrhea, or vomiting of

Cow's Milk Lactalbumin Allergy

prescribe

Meyenberg® Evaporated Goat Milk

A natural milk, nutritionally equivalent to evaporated cow's milk. May be substituted in formulae and recipes with no change in essential nutrient values (new recipe booklet available). Constant control assures uniformity, purity.

At most drug stores in 14-oz. cans. Advertised to the profession only. For information, file cards, and recipe booklets, write

Special Milk Products, Inc.
Los Angeles 64, California • Since 1934

BY THE MAKERS OF *Hi-Pro*—HIGH-PROTEIN, LOW-FAT POWDERED COW'S MILK

For the colic, diarrhea, or vomiting of

Cow's Milk Lactalbumin Allergy

prescribe

Meyenberg® Evaporated Goat Milk

A natural milk, nutritionally equivalent to evaporated cow's milk. May be substituted in formulae and recipes with no change in essential nutrient values (new recipe booklet available). Constant control assures uniformity, purity.

At most drug stores in 14-oz. cans. Advertised to the profession only. For information, file cards, and recipe booklets, write

Special Milk Products, Inc.
Los Angeles 64, California • Since 1934

BY THE MAKERS OF *Hi-Pro*®—HIGH-PROTEIN, LOW-FAT POWDERED COW'S MILK.

RED CROSS* ADHESIVE TAPE

all rolled up into one

NEW EXCLUSIVE FORMULA

greater freedom from skin irritation

sticks better

greater flexibility

lasting freshness

whiter appearance

Johnson & Johnson

* No connection whatever with the American National Red Cross

CONTENTS, JULY, 1950

ORIGINAL ARTICLES—
Basic Principles of Osteopathy. Allan A. Eggleston, D.O., Montreal, Canada.....549
Hyperproteinization. Use in Rheumatic Fever. Robert C. Thomas, D.O., Duncan, Ariz. 553
Anomalous Auriculoventricular Excitation. The Wolff-Parkinson-White Syndrome. Rudolph Gerber, D.O., New York 554
The Early Diagnosis of Cancer. Dorsey A. Hoskins, D.O., Kansas City, Mo.....556
Surgical Principles. Ross B. Thompson, D.O., F.A.C.O.S., Glendale, Calif.....560
Pitfalls and Errors in Roentgen Gastrointestinal Examination. Dwight A. Stiles, D.O., Phoenix, Ariz.....563

EDITORIALS—
Duchenne of Boulogne. Katherine Becker, A.B., Chicago 569
Progress in Obstetrics. Katherine Becker, A.B., Chicago 570

DEPARTMENT OF PROFESSIONAL AFFAIRS—
Committee on Special Membership Effort: Open Letter to Members. Stephen B. Gibbs, D.O., Coral Gables, Fla.....571
Report and Honor Roll.....571
DEPARTMENT OF PUBLIC AFFAIRS—
Bureau of Public Education on Health: Public Health Laws Enacted or Proposed in 1950.....571
OBSTETRICAL AND GYNECOLOGICAL SUPPLEMENT—
Editorials:
Progress. Julian Lansing Mines, D.O., F.A.C.O.O.G., Glendale, Calif.....575
Editorial Resume. Lester Eisenberg, D.O., Philadelphia 575
Articles:
The Use of Posterior Pituitary Extract in the First Stage of Labor. James G. Matthews, Jr., D.O., Highland Park, Mich. 576
Phlebothrombosis and Thrombophlebitis in Obstetrics and Gynecology. John A. Costello. D.O., and Joseph O. Costello, D.O., Los Angeles.....581
Obstetrical Considerations of Human Trophoblast. D. B. Percival, D.O., San Rafael, Calif.....584
Episiotomy and Repair. M. L. Riemann, D.O., F.A.C.O.O.G., Kirksville, Mo...588
Uterine Inversion Following Childbirth With Case History of Spontaneous Reinversion. Seaver A. Tarulis, D.O., Chicago 590
Diabetes Mellitus Complicating Pregnancy. John C. Dickson, Jr., D.O., Trenton, Mich. 594
Endometriosis. Albert F. Kull, D.O., South Bend, Ind.....597
CURRENT MEDICAL LITERATURE. .604
DEPARTMENT OF PUBLIC RELATIONS—
Department of Health, Education, and Security 607
Social Security Act Revision.....609
Midcentury White House Conference on Children and Youth.....609
Food and Drug Administration Has New Chief of New Drug Section.....609
BOOK NOTICES 610
CONVENTIONS AND MEETINGS....ad p. 25
STATE AND NATIONAL BOARDS....ad p. 34

AUTHOR AND SUBJECT INDEX

American College of Osteopathic Obstetricians and Gynecologists:
editorial resume, [Eisenberg].....575-OG
progress, [Mines] 575-OG
Supplement to THE JOURNAL.....573-OG
Arthritis, rheumatoid, delta 5 pregnenolone in, [Davison *et al.*].....605-CML
Becker, Katherine:
Duchenne of Boulogne.....569-E
Progress in obstetrics.....570-E
Book Notices:
Diagnosis and Treatment of Cardiovascular Disease. William D. Stroud, Ed. 610-BN
Current Therapy, 1950. Howard F. Conn, Ed. 610-BN
Medical Gynecology. James C. Janney..610-BN
Roentgen Diagnosis of the Extremities and Spine. Albert B. Ferguson.....610-BN
Penicillin. Alexander Fleming, Ed.....611-BN
Bridges' Food and Beverage Analyses. Marjorie R. Mattice.....611-BN
Postgraduate Gastroenterology. Henry L. Bockus, Ed. 611-BN
Parkinson's Disease. Walter Buchler..611-BN
Rehabilitation, Re-education and Remedial Exercises. Olive F. Guthrie Smith..612-BN
Principles and Practices of Rehabilitation. Henry H. Kessler.....612-BN
Brain and Behaviour. N. E. Ischlondsky 612-BN
Clinical Nutrition. Norman Jolliffe, F. F. Tisdall, and Paul R. Cannon, Eds...612-BN
Cytologic Diagnosis of Cancer. Staff of the Vincent Memorial Laboratory of the Vincent Memorial Hospital.....612-BN
Medicine of the Year, 1950. John B. Youmans, Ed. 613-BN
Medical Management of Gastrointestinal Disorders. Garnett Cheney.....613-BN
Clinical Pathology. Benjamin B. Wells 613-BN
Medical Diseases of the Kidney. J. F. A. McManus 613-BN
Physiology of Heat Regulation and the Science of Clothing. L. H. Newburgh, Ed. 613-BN
Research in Medical Science. David E. Green and W. Eugene Knox, Eds...613-BN
Practice of Urology. Harry C. Rolnick 614-BN
Vitaminology. Walter H. Eddy.....614-BN
Stedman's Medical Dictionary. Norman Burke Taylor, Ed.....614-BN
Howell's Textbook of Physiology. John F. Fulton, Ed.....614-BN
Quindine in Disorders of the Heart. Harry Gold 614-BN
Practical Neurological Diagnosis. R. Glen Spurling 614-BN
Brain, blood flow in vascular diseases [Scheinberg] 606-CML
Breast:
an attempt to evaluate the radical and palliative treatment of carcinoma, [Orr] 587-Ex.
feeding [Watson and Boersma].....604-CML
Cancer: See also Breast
early diagnosis, [Hoskins].....556*
Cesarean section at Chicago Lying-In Hospital—1931-1949, [Dieckmann and [Seski] .....583-Ex.
Children, Midcentury White House Conference on Children and Youth....609-Pu.R
Colleges, osteopathic, graduates.....ad. p. 36
Conventions and meetings.....ad p. 25
Costello, John A., and Costello, Joseph O.: Phlebothrombosis and thrombophlebitis in obstetrics and gynecology.....581-OG
Costello, Joseph O.: See Costello, John A., jt. author
Diabetes Mellitus:
complicating pregnancy, [Dickson].....594-OG
prepared insulin mixtures in, [Dolger] 606-CML
Dickson, John C., Jr.:
Diabetes mellitus complicating pregnancy 594-OG
Di Nolfo, Anthony:
Current medical literature.....605-CML
Duchenne of Boulogne, [Becker].....569-E
Eggleston, Allan A.:
Basic principles of osteopathy.....549*
Eisenberg, Lester:
Editorial resume 575-OG
Endometriosis, [Kull] 597-OG
Episiotomy: See Labor
Examinations: See State and National Boards
Extremities, spot orthoroentgenography, [Goldstein and Dreisinger].....568-CML
Food and Drug Administration, new chief of new drug section.....609-Pu.R
Gastrointestinal tract, pitfalls and errors in roentgen examination, [Stiles].....563*
Gerber, Rudolph:
Anomalous auriculoventricular excitation, the Wolff-Parkinson-White syndrome..554*
Gibbs, Stephen B.:
Open letter to members.....571-Pr.A
Gynecology:
phlebothrombosis and thrombophlebitis in, [Costello and Costello].....581-OG
surgical emergencies, [Philpott].....604-CML
Heart:
anomalous auriculoventricular excitation, the Wolff-Parkinson-White syndrome, [Gerber] 554*
life situations, emotions, and paroxysmal auricular tachycardia, [Duncan *et al.*] 605-CML
Hoskins, Dorsey A.:
The early diagnosis of cancer.....556*
Johnson, Elsa L.:
Current medical literature.....605-CML
Kidney in relation to protein catabolism, [Persike] 606-CML
Kull, Albert F.:
Endometriosis 597-OG
Labor:
episiotomy and repair, [Riemann].....588-OG
use of posterior pituitary extract in first stage, [Matthews] 576-OG
uterine inversion following childbirth, [Tarulis] 590-OG
Legal and Legislative:
Department of Health, Education, and Security 607-Pu.R
Public health laws enacted and proposed in 1950 .....571-Pu.A
Social Security Act revision.....609-Pu.A
Licensure: See State and National Boards
Lipid metabolism, [Deuel].....604-CML
Matthews, James G. Jr.:
The use of posterior pituitary extract in the first stage of labor.....576-OG
Membership, A.O.A.:
applications .....ad p. 40
changes of address and new locations..ad p.38
open letter to members, [Gibbs].....571-Pr.A
report and honor roll.....571-Pr.A
Migraine, dynamics of the attack, [Marcussen and Wolff].....605-CML
Mines, Julian Lansing:
Progress 575-OG
Obstetrics:
human trophoblast, [Percival].....584-OG
progress, [Becker] 570-E
surgical emergencies, [Philpott].....604-CML
thrombophlebitis and phlebothrombosis in, [Costello and Costello].....581-OG
Osteopathy, basic principles, [Eggleston]....549*
Percival, D. B.:
Obstetrical considerations of human trophoblast 584-OG
Pituitary, posterior, extract in the first stage of labor, [Matthews].....576-OG
Pregnancy:
diabetes mellitus complicating [Dickson] 594-OG
venereal disease in, [Rosenthal].....580-Ex.
Protein:
catabolism, relation of kidney [Persike] 606-CML
hyperproteinization in rheumatic fever, [Thomas] 553*
Psychosomatic disorders, personality common to, [Gildea].....605-CML
Public health, laws enacted and proposed in 1950 .....571-Pu.-A
Rheumatic Fever:
hyperproteinization in, [Thomas].....553*
prevention, [Denny *et al.*].....606-CML
Riemann, M. L.:
Episiotomy and repair.....588-OG
Social Security Act revision.....609-Pu.R
State and National Boards:
Alberta, Ariz., Ark., Colo., Conn., D.C., Hawaii, Ill. .....ad p. 34
Iowa, Md., Mich., Minn., Mont., Neb., N.H., N.J., N.Mex., N.Y., Ore., Puerto Rico, R.I., Tenn., Wash., Wis., Wyo. .....ad p. 35
examinations by National Board.....ad p. 36
reregistration of osteopathic licenses..ad p. 36
Stiles, Dwight A.:
Pitfalls and errors in roentgen gastrointestinal examination 563*
Surgical principles, [Thompson].....560*
Swope, Chester D.:
Department of Public Relations.....607-Pu.R
Tarulis, Seaver A.:
Uterine inversion following childbirth, with case history of spontaneous reinversion 590-OG
Terry, Morton:
Current medical literature.....605, 606-CML
Thomas, Robert C.:
Hyperproteinization; use in rheumatic fever 553*
Thompson, Ross B.:
Surgical principles 560*
Thrombophlebitis and phlebothrombosis in obstetrics and gynecology, [Costello and Costello] 581-OG
Trophoblast, human, obstetrical considerations, [Percival] 584-OG
Uterus, inversion following childbirth, [Tarulis] 590-OG
Venereal disease in pregnancy, [Rosenthal] .....580-Ex.
White House Conference on Children and Youth .....609-Pu.R.

Published monthly by the American Osteopathic Association. Office of Publication, 100 S. Kenilworth Ave., Oak Park, Ill. Address all communications to the Main Office at 212 E. Ohio St., Chicago 11, Ill. Subscriptions $10 a year. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized August 31, 1922. Entered at the Oak Park, Ill., post office as second class matter, April 1, 1926, under the Act of March 3, 1879.

READY JULY 1950

Williams

OBSTETRICS

10th (1950) EDITION

By

NICHOLSON J. EASTMAN

In what is probably the finest revision to date of the famous text originally written by J. Whitridge Williams and revised in its 7th, 8th and 9th Editions by Henricus J. Stander, the present author has taken full advantage of his opportunity to reorganize, rewrite, delete, add new material and reillustrate to the full extent necessary to provide the practicing physician and the student with a complete and thoroughly modern text.

Recognizing the need for continued strong emphasis on sound fundamentals, Dr. Eastman has strengthened those sections and in addition he has built up and considerably enlarged the sections on prenatal care, the treatment of the complications of pregnancy, the handling of the delivery, the details of operative procedures, and the uses of all the most modern, recognized methods for the further reduction of maternal and infant mortality.

NICHOLSON J. EASTMAN, Professor of Obstetrics in Johns Hopkins University and Obstetrician-in-Chief to the Johns Hopkins Hospital.

Historical data and theoretical considerations have been reduced to a minimum to provide adequate space for the more practical type of material needed by the practitioner and student.

NEW MATERIAL

Approximately 55 per cent of the text and more than one third of the illustrations are entirely new. Major sections which have been completely rewritten and brought up to date are those dealing with: the ovarian and placental hormones, placental transfer, estimation of pelvic size and shape, the forces concerned in labor, analgesia and anesthesia, abortion, clinical aspects of placenta previa, treatment of syphilis, diabetes mellitus, the toxemias of pregnancy, the management of uterine inertia, prognosis and management of transverse presentations, prognosis of labor in inlet contraction, midpelvic contraction, rupture of the uterus, postpartum hemorrhage, puerperal infection, apnea neonatorum and hemolytic disease of the newborn. Other sections have been partially rewritten and countless minor alterations made.

WILLIAMS OBSTETRICS by N. J. Eastman.
10th Edition. 696 Illustrations.
1200 Pages. Published July 1950.
$12.50 Postpaid.

125th
ANNIVERSARY
1825-1950

APPLETON-CENTURY-CROFTS, Inc.

35 West 32nd Street, • New York 1, New York

These Figures Tell the Story

NUTRIENTS and CALORIES	N.R.C. ALLOWANCES* Physically Active Male	CEREAL SERVING CONTRIBUTION**	PER CENT OF DAILY ALLOWANCES
PROTEIN	70 Gm.	7.1 Gm.	10
CALCIUM	1 Gm.	0.156 Gm.	16
IRON	12 mg.	1.6 mg.	13
PHOSPHORUS	1.5 Gm.	0.206 Gm.	14
VITAMIN A	5000 I.U.	193 I.U.	4
THIAMINE	1.5 mg.	0.17 mg.	11
RIBOFLAVIN	1.8 mg.	0.24 mg.	13
NIACIN	15 mg.	1.4 mg.	9
CALORIES	3000	202	7

OF THE NUTRIENT CONTRIBUTION OF THE CEREAL AND MILK SERVING...

As the table above vividly shows, the nutrient contribution of the cereal and milk serving** is unusually generous, not only as to the number of nutrients, but also as to the amount of each nutrient supplied. In the case of most nutrients, 10 per cent or more of the National Research Council's Recommended Daily Dietary Allowances for a physically active male is supplied by this serving. Of added nutritional significance is its generous contribution of B complex vitamins and iron, and the high calcium content.

The cereal and milk serving, a favorite American main course at breakfast, is outstanding in these respects also: it offers noteworthy economy, unusual ease of preparation, and almost endless variety for renewed palate appeal.

*National Research Council's Recommended Daily Dietary Allowances.

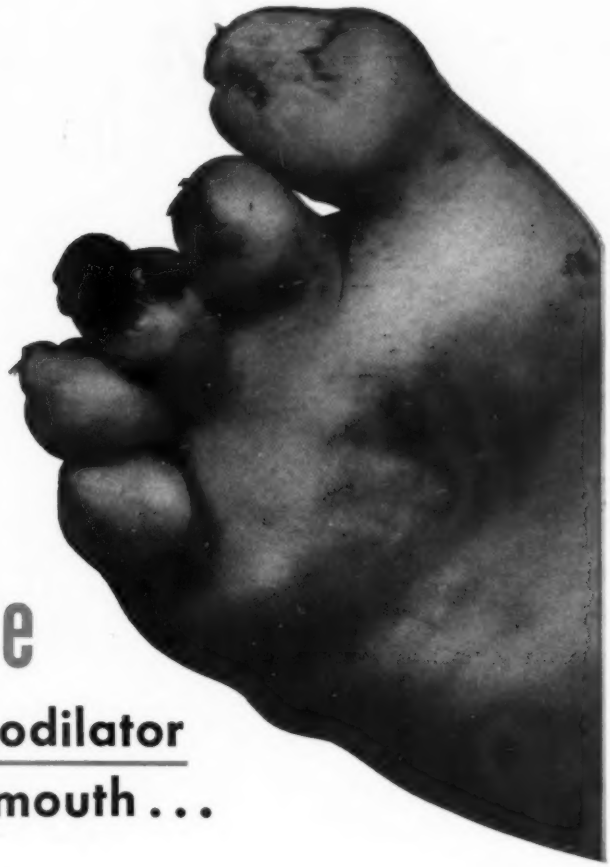
**1 oz. of breakfast cereal, 4 oz. of milk, 1 teaspoonful of sugar. Based on composite average of all breakfast cereals on dry weight basis.

The presence of this seal indicates that all nutritional statements in this advertisement have been found acceptable by the Council on Foods and Nutrition of the American Medical Association.

CEREAL INSTITUTE, INC.

135 South La Salle Street · Chicago 3

A RESEARCH AND EDUCATIONAL ENDEAVOR DEVOTED TO THE BETTERMENT OF NATIONAL NUTRITION



Priscoline

A potent vasodilator effective by mouth...

Priscoline hydrochloride "has a definite place in the armamentarium of drugs... particularly in the field of *peripheral vascular disease*, or for conditions of visceral pain due to vascular spasm. Presumably the drug can be used to a great advantage in those cases in which sympathectomy would be advantageous.... It can also be used as a substitute for paravertebral sympathetic block."[1]

"Priscoline per se appeared to slow down progression of the disease and produce symptomatic benefits in 88 per cent of 25 patients with early proliferative and degenerative *arthritis* involving peripheral joints."[2]

In doses of 25 to 75 mg., administered either orally or parenterally, Priscoline "usually is tolerated with few side effects."[3]

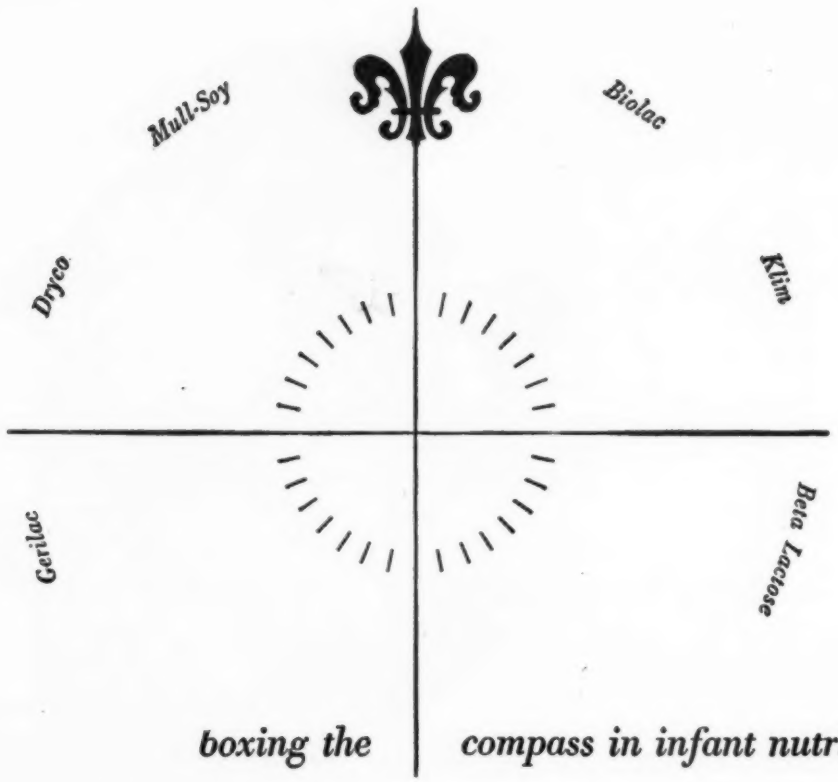
Comprehensive literature on request.

1. Rogers, Max P.: J.A.M.A., May 21, 1949
2. Wyatt, Bernard L.: Ann. West. Med. & Surg., Aug. 1949
3. Grimson, Marzoni, Reardon & Hendrix: Ann. Surg., 127:5, May 1948

PRISCOLINE, Tablets of 25 mg.; 10 cc. Multiple-dose Vials, each cc. containing 25 mg.

Ciba PHARMACEUTICAL PRODUCTS, INC., SUMMIT, NEW JERSEY

PRISCOLINE (brand of benzazoline) Trade Mark Reg. U.S. Pat. Off. 2/1867M



boxing the compass in infant nutrition

North, East, South, West—for every type of nutritional requirement, there is a Borden prescription product scientifically designed to meet the problem.

BIOLAC, Borden's improved, evaporated-type liquid modified milk, provides for all the known nutritional needs of early infancy except vitamin C.

DRYCO, a high-protein, low-fat powdered milk, serves as a valuable food in itself and as a versatile base assuring ample protein intake plus vitamins A and D. MULL-SOY is the answer to milk allergies—an emulsified hypo-allergenic soy food approximating milk. GERILAC, a spray-dried whole milk and skim milk powder, supplies elderly patients with high quality protein, calcium and iron, and also vitamins A, D, B and C. BETA LACTOSE promotes normal intestinal flora and acidity when used as a carbohydrate modifier. KLIM is powdered pasteurized whole milk, spray-dried for rapid solubility, convenient in hot climates and during travel.

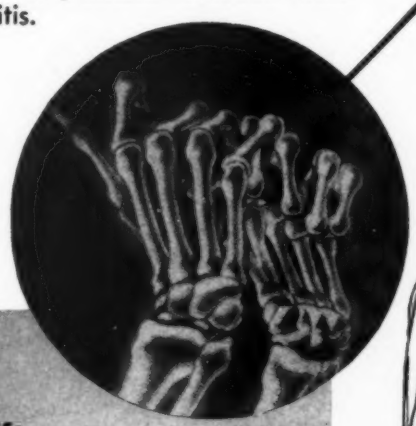
These Borden products conform to the requirements of the Council on Foods and Nutrition and the Advertising Committee of the American Medical Association and are available only in pharmacies. We welcome inquiries from physicians. Write for professional literature and attractive practical Recipe Books.

The Borden Company, Prescription Products Division
350 Madison Avenue, New York 17

Good Grip Restored

In arthritis involving the hands, hips or any other joints, restoration of function and diminution of pain are best accomplished by complete systemic rehabilitation.

Darthronol—furnishing the antiarthritic effects of massive dosage of Vitamin D and the nutritional benefits of 8 other vitamins—plays an important role in the rehabilitation of patients afflicted with chronic arthritis.



EACH CAPSULE CONTAINS:

Vitamin D (Irradiated Ergosterol)	50,000 U.S.P. Units
Vitamin A (Fish Liver Oil)	5,000 U.S.P. Units
Vitamin C (Ascorbic Acid)	75 mg.
Vitamin B_1 (Thiamine Hydrochloride)	3 mg.
Vitamin B_2 (Riboflavin)	2 mg.
Vitamin B_6 (Pyridoxine Hydrochloride)	0.3 mg.
Niacinamide	15 mg.
Calcium Pantothenate	1 mg.
Mixed Tocopherols (Equivalent to 3 mg. of Synthetic Alpha Tocopherol)	4 mg.

CAUTION: To be dispensed only on the prescription of a physician.

Darthronol

for the ARTHRITIC

J. B. ROERIG & COMPANY • 536 LAKE SHORE DRIVE, CHICAGO 11, ILL.

How Pet Milk Helps in Your Fight Against Disease

What is more important to the newborn infant than clean, safe food? Is not this your first concern when choosing a milk for your infant patients?

When you use Pet Evaporated Milk for infant formula, you are assured of a completely safe formula, as if there were no germs of disease in the world. Pet Milk is heat-sterilized in its sealed container, protected permanently from any source of contamination prior to actual consumption.

You are assured, too, that safe Pet Milk retains all of the food values that the best of milk can be depended upon to supply, and that these food values are uniform wherever and whenever Pet Milk is purchased.

Try Pet Milk for the babies in your care! Let this safe low-cost milk help you in your continuous fight against disease.

Favored For Infant Formula

PET MILK COMPANY
1464-G Arcade Building
St. Louis 1, Missouri

fr

Pollens may invade the air as early as January in California and last through December in Florida.

wherever hay fever may be

and whatever the pollens, a valued measure of symptomatic relief can be expected in most patients with

Trimeton®

(brand of prophenpyridamine)

TRIMETON,® one of the first of the more potent antihistaminic compounds, continues to be, as always, a reliable means of making the hay fever sufferer more comfortable. Because the incidence of side effects is relatively low, it is rarely necessary to discontinue TRIMETON.

Packaging: TRIMETON Tablets (prophenpyridamine) 25 mg. Bottles of 100 and 1000 scored tablets. TRIMETON Maleate Elixir containing 7.5 mg. per teaspoonful is available in bottles of 4 and 16 oz. Patients taking TRIMETON should be informed of the nature of side effects common to all antihistamines.

TRIMETON

SCHERING

Schering CORPORATION · BLOOMFIELD, NEW JERSEY

CEREAL LACTIC in TWO FORMS

Cereal Lactic (Improved Vitamin) formula—supplies lactic acid organisms, vitamins and EIGHT essential enzymes. This formula is indicated in GASTRO-INTESTINAL disorders when hyperacidity and flatulence ARE NOT symptoms.

Cereal Lactic (Antacid and Adsorbent) formula—supplies lactic acid organisms and enzymes PLUS an effective antacid and adsorbent formula. This product is indicated in GASTRIC disorders when hyperacidity and flatulence ARE symptoms.

Both products are widely prescribed by the Profession as an effective treatment for Gastro-Intestinal disorders.

CEREAL LACTIC

Clip the following information for your CEREAL LACTIC files:

Cereal Lactic for Infant Nutrition

Cereal Lactic (Improved Vitamin) is ideal for infant nutrition, for several excellent reasons. It is high in lactic acid content, producing 0.4 to 0.6 per cent acidity with a pH of about 4.00 when added to milk. In addition, it supplies enzymes, certain minerals, and important vitamins. You in the profession fully appreciate the importance of these factors in augmenting the infant's diet, as well as in performing definite regulatory effects on the digestive tract.

Cereal Lactic (Improved Vitamin) contributes greatly in supplementing the normal vitamin content of milk, and in making up, to a large degree, the vitamin and mineral deficiencies of milk. Remember, too, that the enzymes present in Cereal Lactic (Improved Vitamin) aid considerably in the conversion of starch and other carbohydrates into more easily assimilated elements.
Physicians' samples and complete information upon request.

CEREAL LACTIC COMPANY WOODWARD, IOWA

New Book—Just Published!

Gregg—Coronary Circulation in Health and Disease

By DONALD E. GREGG, M.S., Ph.D., M.D.

Chief Research Physician, Medical Department, Field Research Laboratory, Fort Knox, Kentucky

This book crystallizes present-day thinking of coronary circulation. It is based on more than 15 years of experimental work by Dr. Gregg. Full consideration of the problem as it currently exists is given first, followed by a discussion of the morphological aspects. *Experimental approaches* are considered extensively, including preparations used, determination and registration of mean and phasic cardiac pressures, blood flow, controlling mechanisms, etc.

Special attention is given to the *peculiarities* of the coronary circulation and to other important experimental findings, such as the functioning of distribution channels for coronary inflow and especially outflow, interpretation of phasic flow and pressure curves, the intimate action of drugs, etc. An entire chapter is devoted to The Coronary Circulation in Heart Disease and Heart Failure, with emphasis on atheromatous lesions in man.

New Book. 227 Pages. 73 Illustrations. $4.50

New (2nd) Edition. **Thorndike — Manual of Bandaging, Strapping & Splinting**

By AUGUSTUS THORNDIKE, M.D., F.A.C.S.

Associate in Surgery, Harvard Medical School; Chief Surgeon to the Department of Hygiene, Harvard University

Dr. Thorndike gives the proper technics of dressing, bandaging and splinting. Emphasis is on principles of support, elevation, immobilization and gentle compression.

The author has brought his book fully up-to-date and includes all of the newer bandage materials, with advice on how to use them.

New (2nd) Edition. 148 Pages. 119 Illustrations. $2.00

Washington Square **LEA & FEBIGER** Philadelphia 6, Pa.

Treatment of Sinuses with Short Wave Diathermy using Hogan Brevatherm No. 9000 with Stand and Treatmaster. Watch this space for other techniques.

THE EASE
Of Sinus Treatment

is exemplified with the Hogan Brevatherm and the Treatmaster. The sanitary aspect is greatly preferable to the unwholesome sinus masks of yester-year.

With this apparatus you can apply short wave diathermy effectively with a great saving of time over other methods.

With this apparatus you are prepared to give your patients the best that diathermy offers. All this with the sturdy construction and quality that characterize McIntosh lifetime service. Cost is but moderate.

F.C.C. TYPE APPROVAL No. D-524

McIntosh Electrical Corp.

71st Anniversary, Feb. 4, 1950

229 N. Calif. Ave. Chicago 12, Ill.

Gentlemen:

☐ **Literature, please, on Hogan Brevatherm and Treatmaster.**

I now have a..... short wave diathermy..... years old.

☐ **Please have representative call.**

☐ **69th Edition Catalogue, please.**

SIGNED.....

ADDRESS.....

CITY..... ZONE..... STATE.....

A.O.A.

SIMPLE TEST PROVES *INSTANTLY* PHILIP MORRIS ARE LESS IRRITATING

*Now you can confirm for yourself, Doctor, the results of the published studies**

HERE IS ALL YOU DO:

1 ..light up a PHILIP MORRIS
Take a puff—DON'T INHALE. Just s-l-o-w-l-y let the smoke come through your nose. AND NOW

2 ..light up your present brand
DON'T INHALE. Just take a puff and s-l-o-w-l-y let the smoke come through your nose. Notice that bite, that sting? Quite a difference from PHILIP MORRIS!

With proof so conclusive ... with your own *personal experience* added to the published studies* ... would it not be good practice to suggest PHILIP MORRIS to your patients who smoke?

PHILIP MORRIS

Philip Morris & Co., Ltd., Inc., 100 Park Avenue, New York 17, N. Y.

**Proc. Soc. Exp. Biol. and Med., 1934, 32, 241-245; N. Y. State Journ. Med., Vol. 35, 6-1-35, No. 11, 590-592; Laryngoscope, Feb. 1935, Vol. XLV, No. 2, 149-154; Laryngoscope, Jan. 1937, Vol. XLVII, No. 1, 58-60*

A UNIQUE ANALGESIC BANDAGE
PROVIDING CONTINUOUS LOCAL PAIN RELIEF

plus

CONTROLLED SYSTEMIC SALICYLATE DOSAGE

POLYESTOL

Pain-Relieving Bandage

A highly elastic, transparent plastic bandage which gives off 45 to 50 Gm. of methyl salicylate for transcutaneous absorption at a constant rate when in use. The bandage may be applied for a total of sixty hours (never more than ten hours at a time). It can be stored between applications without danger of deterioration.

CHECK THESE OUTSTANDING ADVANTAGES ● Local pain relief is rapid and sustained ● Continuous absorption of methyl salicylate and conversion to salicylic acid in body contribute to systemic salicylate therapy ● Application is simple, convenient, and clean . . . does not soil clothing ● Bandage provides immobilization or support where required ● Avoids gastric upset associated with oral salicylate therapy . . . does not cause salicylism.

HELPFUL IN ● Rheumatoid ailments and acute rheumatic fever, fibrositis, lumbago, gout, myalgia, neuralgia, muscle stiffness, sprains, strains, etc.; valuable adjunct in cases requiring oral or parenteral salicylate therapy.

AVAILABLE through surgical supply dealers and prescription pharmacies. Complete information and sample for examination on request.

McLINTOCK

DUNCAN C. McLINTOCK CO., INC.
591 MAIN ST., HACKENSACK, NEW JERSEY

NEW MACMILLAN BOOKS

VORHAUS

A GUIDE TO GENERAL MEDICAL PRACTICE

The senior medical student, the interne or resident, and the physician new to practice will find this explanation of the history, development and fundamentals of general medical practice of inestimable value. Initially the book discusses the proper selection of interneships and residencies, consideration of locality for practice, the establishment of an office, and actual development of practice. Part II explains the approach to frequent clinical problems taking into consideration the diagnosis and treatment. The role of the physician as family adviser is discussed in Part III.

by Martin Vorhaus, M.D., 244 pp., $3.50

GREEN-KNOX

RESEARCH IN MEDICAL SCIENCE

This new book presents in essay form those developments that are constantly taking place in the field of medical research. Essays included are written by various outstanding representatives in the fields of chemotherapy, therapeutics, physiology, epidemiology, microbiology, anthropology, and allied sciences. These contributors offer non-technical accounts of the work which has been done in these fields to date and indicate the most likely paths of future progress.

Edited by David E. Green, Ph.D., and W. Eugene Knox, M.D., 492 pp. $6.50

THE MACMILLAN COMPANY, 60 Fifth Ave., New York 11, N.Y.

FOR INFANT FEEDING IN HOT WEATHER

...at home

...away

LACTOGEN

Hot summer months need bring no infant feeding problems. Lactogen fed babies keep happy, healthy. When refrigeration is not available feedings may be prepared as needed.

ACCEPTED COUNCIL ON FOODS AND NUTRITION AMERICAN MEDICAL ASSOCIATION

LACTOGEN®	+ WATER =	FORMULA
1 level tablespoon (40 Cals.)	2 fl. ozs.	2 fl. ozs. (20 Cals. per fl. oz.)

ADVERTISED TO THE MEDICAL PROFESSION ONLY

	Calories	Protein Gm.	Calcium Gm.	Copper mg.	Iron mg.	Phosphorus Gm.	Vitamin A I. U.	Thiamine mg.	Riboflavin mg.	Niacin mg.	Ascorbic Acid mg.	Vitamin D I. U.
National Research Council Allowances, Sedentary Man (154 lbs.)	2,400	70	1.0	1.2	12	1.5	5,000	1.2	1.8	12	75	Small Amount
Ovaltine in Milk, 3 Servings *	676	32	1.12	0.5	12	0.94	3,000	1.16	2.0	6.8	30	417
Percentages of N. R. C. Allowances Provided by 3 Servings* of Ovaltine in Milk	28%	46%	112%	42%	100%	63%	60%	97%	111%	57%	40%	Abundance

*Each serving made of ½ oz. of Ovaltine and 8 fl. oz. of whole milk.

Supplementation

A sure step to dietary adequacy

The aim of the dietary at all times and under all conditions is to provide ample amounts—not just minimum amounts—of all nutrient essentials. Only when the daily nutrient intake is fully adequate, based on the most authoritative nutritional criteria, can the possibility of adequate nutrition be assured. It is for this reason that a food supplement assumes great importance in daily practice. It should be rich in those nutrients most likely deficient in prevailing diets or in restricted diets during illness and convalescence.

The *multiple nutrient dietary food supplement*, Ovaltine in milk, is especially suited for transforming even poor diets to full nutritional adequacy. This is clearly shown by the data in the table above.

Note in particular the high percentages of the dietary allowances for nutrients and the relatively low percentage of the total calories furnished by the servings of Ovaltine in milk. Thus, without unduly increasing the caloric intake, Ovaltine in milk greatly increases the contribution of nutrient essentials. Enticing flavor and easy digestibility are other important features of this dietary supplement.

Two kinds, Plain and Sweet Chocolate Flavored. Serving for serving, they are virtually identical in nutritional content.

Ovaltine

THE WANDER COMPANY, 360 N. MICHIGAN AVE., CHICAGO 1, ILL.

NONTOXIC....

NONALCOHOLIC.....

Simplified Way to Give High Doses of Methenamine for Urinary Antisepsis

UROLITHIA.....

Reg. U. S. Pat. Off.

Combining in one medication:

- the antiseptic action of *methenamine*
- the urine-acidifying effect of *lithium and sodium benzoates*
- in a soothing menstruum containing glycerin and extractives of *couch-grass* and *corn-silk*

SUPPLIED: Amber bottles containing 10 fl.oz., on prescription.

Professional literature on request,

Cobbe Pharmaceutical Division

BORCHERDT MALT EXTRACT CO.

217 N. Wolcott Avenue,

CHICAGO 12, ILLINOIS

ACTIVE INGREDIENTS
Zinc Chloride - Menthol
Formaldehyde - Saccharine
Oil Cinnamon - Oil Cloves
Alcohol 5%

MOUTHCARE:

Lavoris acts to detach and free germ-harboring film from mouth and throat leaving the tissues cleansed, refreshed and invigorated.

LAVORIS
MOUTHWASH AND GARGLE
REG. U.S. PAT. OFF.

If you want a clean mouth and pleasant breath—

Lavoris is for you

A PRODUCT OF MERIT FOR NEARLY 50 YEARS

THE LAVORIS COMPANY • MINNEAPOLIS 1, MINN.

NO WONDER SO MANY DOCTORS THROUGHOUT THE NATION PRESCRIBE

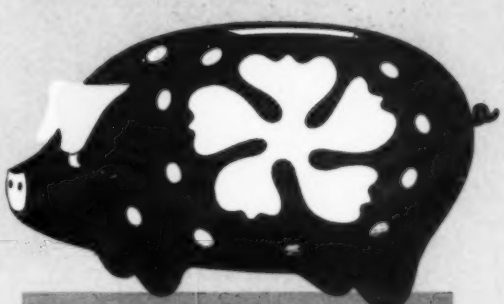
The Stuart Hematinic

COMPARE

THESE HIGH POTENCIES* OF IRON, COPPER, B COMPLEX AND C

THE STUART HEMATINIC	CONTENTS PER TABLET	CONTENTS PER 6 TABLETS
FERROUS GLUCONATE . . .	3 grs.	18 grs.
COPPER SULPHATE	2.5 mg.	15 mg.
B COMPLEX		
Liver Fraction . . . . . (alcohol insoluble—natural B Complex)	6 grs.	36 grs.
Thiamin Chloride	3.3 mg.	20 mg.
Riboflavin	1.7 mg.	10 mg.
Niacin Amide	25 mg.	150 mg.
Calcium Pantothenate . .	1.7 mg.	10 mg.
Pyridoxin Hydrochloride .	0.5 mg.	3 mg.
VITAMIN C	25 mg.	150 mg.

DOSE: one or two tablets after each meal



PLUS:

LOW COST TO YOUR PATIENTS

BOTTLE OF 100 CAPSULE-SHAPED TABLETS **$2.95**

PLUS:

THESE OTHER ADVANTAGES

Contains Ferrous Gluconate (better tolerated—greater iron utilization**). Contains Liver Fraction for Natural B Complex. Unique tablet structure separates all the non-compatible substances for complete stability. Tablets disintegrate gradually in the stomach, releasing iron at a desirable rate.

Also Available

The STUART HEMATINIC with FOLIC ACID

. . . the same as the Stuart Hematinic except for the addition of 4.5 mg. of Folic Acid per 6 tablets.

Bottle of 100 capsule-shaped tablets, **$3.85**

*Potencies and balance cover latest standards for multiple therapeutic dosage: 1. *Rehabilitation Through Better Nutrition*, 1947—Spies. 2. *Journal of American Medical Association*, Oct. 27, 1945; 129:613—Jolliffe. 3. *Vitamin Deficiencies: Stigmas, Symptoms and Therapy* (J. A. M. A., June 22, 1946; 131:666—Council on Foods and Nutrition). 4. *Clinical Hematology*, Dec. 1946, Pg. 340—M. M. Wintrobe. ** *Journal of Clinical Investigation*, 16:547-54, 1937—Paul Reznikoff and W. F. Goebel.

NO WONDER SO MANY DOCTORS THROUGHOUT THE NATION PRESCRIBE

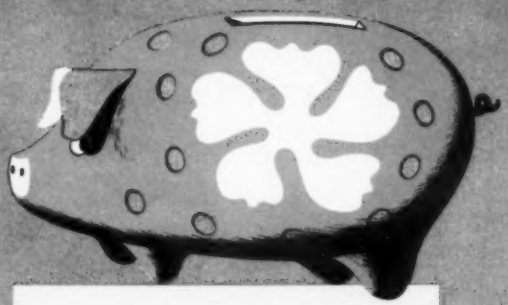
The Stuart Hematinic Liquid

COMPARE

THE PLEASANT TASTE AND THESE HIGH POTENCIES OF IRON, B COMPLEX AND C

THE STUART HEMATINIC LIQUID	Contents per teaspoonful (5 cc.)	Contents per 2 tablespoonfuls (1 fl. oz.—30 cc.)
FERROUS GLUCONATE . .	3 grs.	18 grs.
B COMPLEX		
Thiamin Chloride	1.7 mg.	10 mg.
Riboflavin	1.7 mg.	10 mg.
Niacin Amide	10 mg.	60 mg.
Panthenol	1.43 mg.*	8.6 mg.**
Pyridoxin Hydochloride	0.5 mg.	3 mg.
Liver concentrate . . .	From 20 grs. whole liver	From 120 grs. whole liver

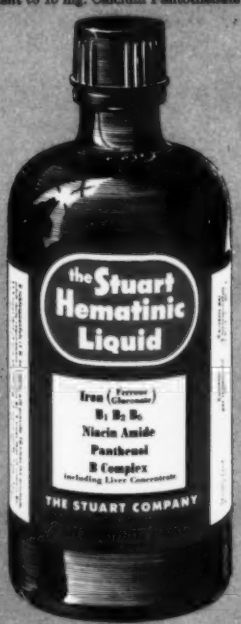
*Equivalent to 1.7 mg. Calcium Pantothenate
**Equivalent to 10 mg. Calcium Pantothenate



PLUS:

LOW COST TO YOUR PATIENTS

1 PINT **$3.45**



PLUS:

THESE OTHER ADVANTAGES

Contains Ferrous Gluconate (better tolerated – greater iron utilization†). Contains Liver Concentrate for natural B Complex factors. Low viscosity.

the Stuart Company

†*Journal of Clinical Investigation, 16:547-64, 1937*—Paul Rosenthal and W. P. Goebel

so safe...

The more than two billion TAMPAX tampons purchased in the past twelve years (plus extensive clinical tests*) bespeak the inherent safety of these dainty intravaginal cotton guards.
They do not cause vaginitis or erosion, and cannot block the flow.
The three absorbencies (Regular, Super, Junior) individualize menstrual hygiene —and are amazingly comfortable and convenient, and thoroughly adequate.

*West. J. Surg., Obstet. & Gynec., 51:150, 1943; J.A.M.A. 128:490, 1945; Am. J. Obst. & Gynec., 48:510, 1944, etc.

TAMPAX INCORPORATED
PALMER, MASS.

AOA-70

the internal menstrual guard of choice **TAMPAX**

Your request will bring related literature and professional samples promptly.

ACCEPTED FOR ADVERTISING BY THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

SEND FOR A PHYSICIAN'S SAMPLE OF OUR
PROTEIN DIGEST No. 26

Sidamine Tablets
or
Sidamine Granules

the amino acid tablet—uncoated—but carrying 70% protein.
no dextrose or other carbohydrate filler.

In writing for samples, please give your degree.

Professional Foods

Cedar Rapids, Iowa

COLCIN PAN-ENZYMES NORMIN

Send for details on a sound reducing regime and plan.

Official Automobile Emblem

Now Available

First shipment since pre-war days. Ready for immediate delivery.

Design, consisting of green cross and gold lettering on white background, is executed in best quality baked enamel on a heavy bronze convex shield. Washable and weather-proof.

Fitted with steel bracket for attachment to license plate holder.

Recognized by many local and state police departments.

Supplied only to members of the American Osteopathic Association.

Price $1.50, Postpaid

American Osteopathic Association

212 E. Ohio Street **Chicago 11, Illinois**

CAMP

for POSTOPERATIVE and POSTPARTUM NEEDS

Basic design and the unique system of adjustment make a large variety of Camp Scientific Supports especially useful as postoperative aids. Surgeons and physicians often prescribe them as assurance garments and consider them essential after operation upon obese persons, after repair of large herniae, or when wounds are draining or suppurating. A Camp Scientific Support is especially useful in the postoperative patient with undue relaxation of the abdominal wall. Obstetricians have long prescribed Camp Postoperative Supports for postpartum use. Physicians and surgeons may rely on the Camp-trained fitter for precise execution of all instructions.

If you do not have a copy of the Camp "Reference Book for Physicians and Surgeons", it will be sent on request.

THIS EMBLEM is displayed only by reliable merchants in your community. Camp Scientific Supports are never sold by door-to-door canvassers. Prices are based on intrinsic value. Regular technical and ethical training of Camp fitters insures precise and conscientious attention to your recommendations.

S. H. CAMP AND COMPANY, JACKSON, MICHIGAN

World's Largest Manufacturers of Scientific Supports

Offices in New York • Chicago • Windsor, Ontario • London, England

GET ACQUAINTED OFFER

Thousands Of Physicians Rely On Our Quality & Service

DESOXYCORTICOSTERONE, 5 mgs. per cc, oil or aqueous	10 cc Vial $6.50
ASCORBIC ACID AMPULES, 1 Gm. per 10 cc	Box of 12 $4.50
PROCAINE PENICILLIN G, 300,000 units per cc in oil, 96 hour type	10 cc Vial $1.95
PROCAINE PENICILLIN G, 300,000 units per cc in Aqueous Suspension (Stable room temp.)	10 cc Vial $2.90
ESTROGENS NATURAL, oil or aqueous, 20,000 I.U. per cc	30 cc Vial $3.00
ESTRONE, pure, no impurities, oil or aqueous, 2 mgs. per cc	30 cc Vial $3.50
TESTOSTERONE, 50 mgs. per cc (propionate or aqueous)	10 cc Vial $3.50
METHYL TESTOSTERONE, 10 mgs. per tablet, (Oral use)	Bottle of 100 $5.00
PROGESTERONE, oil or aqueous, 25 mgs. per cc	30 cc Vial $5.50
VITAMIN B-12 (Crystalline-Merck material) 15 Micrograms per cc	10 cc Vial $1.95
PYRIDOXINE-THIAMINE, 100 mgs. of each per cc (Nausea, vomiting)	10 cc Vial $3.00

QUALITY AND POTENCY POSITIVELY GUARANTEED

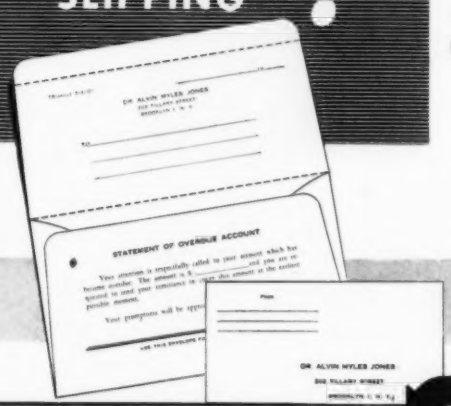
TERMS: Remittance with order, prepaid, or C.O.D. plus charges. Direct by mail only—subject to withdrawal without notice.

MAIL YOUR ORDER AND REMITTANCE TODAY TO

MORTON Pharmaceuticals

DEPT. RX 1045 EAST PARKWAY S. MEMPHIS, TENNESSEE

ARE YOUR COLLECTIONS SLIPPING ?



Collectvelope*

A NEW COLLECTION IDEA THAT OBTAINS REMARKABLE RESULTS

"Collectvelope" is a COMBINATION request for payment and reply envelope. It is breaking all doctors' collection records because it makes it easy for patients to pay.

SEE THIS AMAZING NEW ITEM ACTUAL SAMPLES FREE ON REQUEST

* Reg. U.S. Pat. Off.

DOLLARS COLLECTED ARE DOLLARS EARNED

PROFESSIONAL PRINTING CO., INC.
202 Tillary Street, Brooklyn 1, N. Y.

Gentlemen: Send me actual samples and all details on the NEW "Collectvelope."
Dr. _____

_____

_____ 4-7-0

PROFESSIONAL PRINTING COMPANY, INC.
America's Largest Printers to the Professions
202-208 TILLARY ST., BROOKLYN 1, N. Y.
STATIONERY · MISTACOUNT PRODUCTS · PRINTING · RECORDS · FILES & SUPPLIES

AS NEW AS TOMORROW

SUMMER PSORIASIS CALLS FOR RIASOL

The actinic rays of summer sunlight may aggravate many cases of psoriasis. In addition, the humiliation resulting from exposure of the ugly patches makes effective treatment imperative.

The unique chemical combination of mercury with soaps in RIASOL penetrates the stratum corneum and brings the therapeutic agent in direct contact with the psoriatic lesions in the deeper layers of the skin.

Usually with the use of RIASOL, the unsightly red patches and the obnoxious silvery scales soon start to disappear. In many cases the skin patches clear completely and there are prolonged remissions.

RIASOL contains 0.45% mercury chemically combined with soaps, 0.5% phenol and 0.75% cresol in a washable, non-staining, odorless vehicle.

Apply daily after a mild soap bath and thorough drying. A thin, invisible, economical film suffices. No bandages necessary. After one week, adjust to patient's progress.

RIASOL is ethically promoted. Supplied in 4 and 8 fld. oz. bottles at pharmacies or direct.

Mail coupon today for your free clinical package. Prove RIASOL in your own practice.

Before Use of Riasol

After Use of Riasol

MAIL COUPON TODAY—
TEST RIASOL YOURSELF

SHIELD LABORATORIES
12850 Mansfield Ave., Detroit 27, Mich.

JAOA 7-50

Please send me professional literature and generous clinical package of RIASOL.

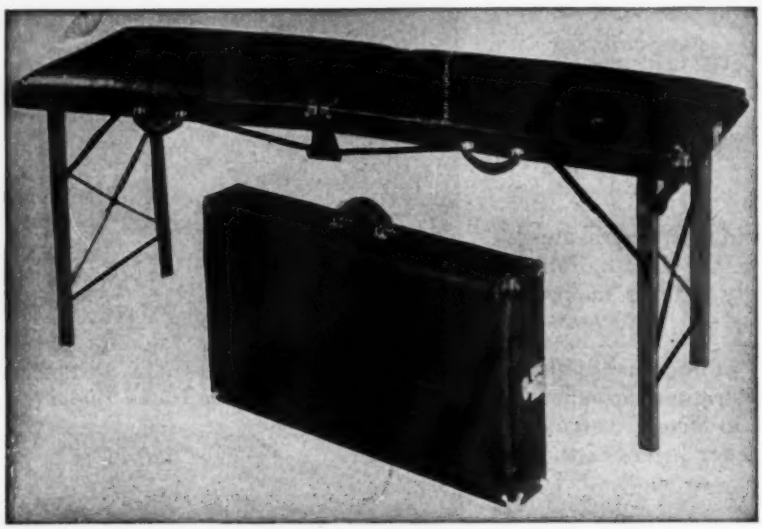
.....D.O. .....Street

City .....Zone ..... State.....

Druggist .....Address .....

RIASOL for PSORIASIS

Treatment Tables and Stools Available



Paratex (rubber and hair composition) padding available at extra cost—
1½" thick, $12.00; 2" thick, $15.00.

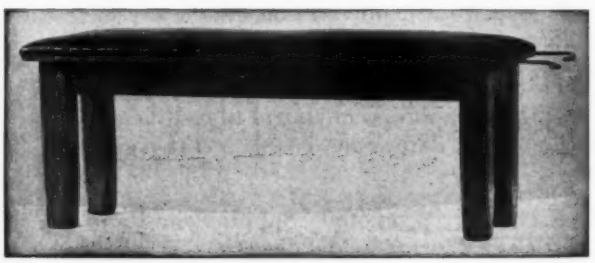
IDEAL FOLDING TABLE

Well constructed, strong.
Will not tip or shake.
Easy to open and close.
Length 69". Width 22".
Height 27½". Weight 32 lbs.
Walnut finish.
Simulated leather covering.
Heavy standard padding.
Shipping weight 35 to 37 lbs.

Price—$40.00

IDEAL STRAIGHT TABLE

Handmade by expert craftsmen.
Handsome, Strong, Durable, Comfortable.
Solid oak legs 3"x4".
Length 72". Width 22".
Height 27½". Shipping weight 125 to 130 lbs.
Brown artificial leather cover over heavy standard padding.



Paratex padding at extra cost—
1½" thick, $12.00; 2" thick, $15.00
Heavy Standard Padding—$45.00.

IDEAL STOOL

Sturdy and well-made. Will not tip over.
Solid oak construction. Three and four rungs. Top made of one piece solid oak 1½" thick.
Light oak, dark oak or walnut finish.
Length 22". Width 14". Height 20". Shipping weight 25 lbs.
Polished top.....$25.00 Upholstered top.....$28.00

The manufacturers of these tables and stools give an unconditional guarantee on workmanship and materials. All items shipped f.o.b. from factory in Kirksville, Mo. Cash must accompany orders.

DISTRIBUTORS

212 E. Ohio St., Chicago 11, Ill.

American Osteopathic Association

Foundations

When first you planned to become a member of your honored profession, Doctor, you began to build the foundations for a lifetime of service. You planned for permanency—for the future—the long years ahead—not just for tomorrow.

Here, at Vitaminerals, we, too, have always tried to plan soundly, for the "long pull". We have never interested ourselves in temporary "flash-in-the-pan" opportunities. That is why every Vitaminerals' product reflects our intention to build a business with dietary supplements which will stand the acid test of trial, and time.

We both have the same objective, Doctor—to serve humanity to the very best of our ability so that, down through the years, we may hold and enjoy the confidence of our fellow men.

PROFESSIONAL LITERATURE ON REQUEST

VITAMINERALS INC.

GLENDALE 1, CALIFORNIA

AN ADVANCE IN ANTIBACTERIAL THERAPY

FURACIN**
SOLUBLE DRESSING
N. N. R.
†(BRAND OF NITROFURAZONE)
CONTAINS 0.2% NITROFURAZONE N. N. R. IN A WATER SOLUBLE BASE.
CAUTION: TO BE DISPENSED ONLY BY OR ON THE PRESCRIPTION OF A PHYSICIAN.
WARNING: THIS DRUG MAY CAUSE SENSITIZATION. IF THIS OCCURS, ITS USE SHOULD BE DISCONTINUED.
LITERATURE AVAILABLE TO PHYSICIANS ON REQUEST.
AN ANTIBACTERIAL PREPARATION FOR TOPICAL APPLICATION.
EATON LABORATORIES Inc.
NORWICH, NEW YORK
ONE POUND, AVOIR

ACCEPTED COUNCIL ON PHARMACY AND CHEMISTRY AMERICAN MEDICAL ASSOCIATION

NEW AND NONOFFICIAL REMEDIES · 1949 · STATES:

"NITROFURAZONE—Furacin . . . possessing bacteriostatic and bactericidal properties . . . effective in vitro and vivo against a variety of gram-negative and gram-positive bacteria . . . is useful for topical application in the prophylaxis and treatment of superficial mixed infections common to contaminated wounds, burns, ulceration and certain diseases of the skin. . . . Variant bacterial strains showing induced resistance to sulfathiazole, penicillin or streptomycin are as susceptible to nitrofurazone as their parent strains . . ." Furacin® brand of nitrofurazone N.N.R. is available in 0.2 per cent concentration in water-miscible vehicles. It is indicated for topical application *in the prophylaxis or treatment of surface infections* of wounds, severe burns, cutaneous ulcers, pyodermas, skin grafts and bacterial otitis. *Literature on request.*

EATON LABORATORIES, INC., NORWICH, NEW YORK

The NITROFURANS

A unique class of antibacterials

FURACIN SOLUBLE DRESSING · FURACIN SOLUTION · FURACIN ANHYDROUS EAR SOLUTION

The Journal of the American Osteopathic Association

PUBLISHED MONTHLY BY THE AMERICAN OSTEOPATHIC ASSOCIATION

Vol. 49, No. 11 | 212 East Ohio St., Chicago 11, Ill. | July, 1950
COPYRIGHT, 1950, BY AMERICAN OSTEOPATHIC ASSOCIATION

Basic Principles of Osteopathy*

ALLAN A. EGGLESTON, D.O.
Montreal, Canada

An osteopathic lesion represents a facilitated segment of the spinal cord maintained in that state by impulses of endogenous origin entering the corresponding dorsal root. All structures receiving efferent nerve fibers from that segment are, therefore, potentially exposed to excessive excitation or inhibition.[1]

This conclusion, arising from osteopathic research, was published in 1947.

. . . sensation must be normal and always on guard to give notice by local and general misery, of unnatural accumulation of circulating fluids. Each set of nerves must be free to act and do their part.[2]

This observation was published by A. T. Still in 1899.

Both of these are basic principles of osteopathy although widely separated in time and influenced by the continuing accumulation of information.

In considering basic principles, we must not limit our thinking to that which is old in time. Principle is defined as "a general truth; a fundamental truth or tenet; a law from which others are derived or on which others are founded."[3]

Basic principles of osteopathy are truths concerning the human body, its health and disease—truths that emphasize the intrinsic ability of the body to maintain itself in health and to overcome disease. They are basic because they are truths, regardless of the date of their pronouncement. "We say great truths, and use many other qualifying expressions. But no one truth is greater than any other truth."[4]

Indeed, it is difficult to determine what is truth. Observations that appear to be true in the light of current knowledge may be discredited by later information. As an example, many readers were originally taught that the atom was the smallest particle of matter and that it could not be divided, but none of us accept that as truth today.

The rapid expansion of medical sciences in the twentieth century has dealt harshly with many accepted medical postulations. Thomas recently pointed out that the oldest medical preparation that remains popular today, aspirin, dates from the turn of the century.[5] Increasing knowledge of pharmacodynamics and physiological chemistry has rendered the vast bulk of nineteenth century medication obsolete. In view of this rapid transition in therapeutic thought, it is amazing to realize that the principles pronounced by Still and his early disciples have remained constant. Indeed, they have become true principles in the dictionary sense that they are laws upon which others are founded. Clinical and laboratory investigation continues to enlighten and enrich the great field of therapeutic philosophy opened by Still.

Investigations widely separated in time and locale have illustrated the soundness of Still's original concept. Drucker[6] has demonstrated that the extensive work reported on the investigation of referred pain parallels and overlaps studies of the osteopathic lesion. It has been widely noted that conclusions reached by Speransky[7] and his co-workers on the role of the nervous system in disease processes complement and support the tenets of osteopathy.[8] Ussher's[9] analysis and application of the viscerospinal syndrome also follows the path of medical philosophy blazed by Still. Wilbur[10] has stated that biologic thinking has replaced empiricism and that physical medicine now occupies a place of prime importance.

Osteopathy is no longer an isolated school of medical thought since others are exploring the same philosophy. It is by far the most advanced in the practical therapeutic application of that philosophy and, because of its vast clinical experience, it has a great responsibility to humanity for the continued improvement of health care. This responsibility can be discharged only through further development of basic osteopathic fundamentals and clinical application of that development.

The principles upon which osteopathy was founded, and upon which it has continued to grow, have been stated by many writers in the past 50 years. They have been presented in many forms and discussed in many lights, so that it is difficult to avoid repetition in discussing them today. The fact that they continue to serve as the foundation of osteopathy when that science has celebrated its Diamond Jubilee illustrates both the soundness and the magnitude of those principles.

Simply stated, three of these precepts are:

1. That the body possesses the inherent ability to maintain itself in health and to recover from dis-

*Presented at the General Sessions, Fifty-Third Annual Convention of the American Osteopathic Association, St. Louis, July 12, 1949.

ease, providing all its component parts and systems are functioning normally

2. That mechanical or structural disturbances occur in the body which interfere with, or impede, the normal functioning of certain of its parts or systems

3. That such mechanical or structural disturbances can be recognized and understood and that it is possible to apply treatment which will overcome such disturbances or enable the body to compensate for them.

Like all truths, when once stated, these principles appear simple and self-evident. A superficial belief in the first principle is expressed by people almost universally. The patient with the least possible information concerning his body will delay consultation with a physician in the belief that he will get well in a couple of days. His faith in the ability of his body to recover from disease is based on experience. He has been ill before and recovery has followed, so why should it not do so again? He reiterates his faith in the inherent ability of the body when he tells the doctor that "something went wrong," implying that if everything had "gone right" he would not be ill.

At the other end of the intellectual scale, Lecomte du Noüy[11] has pointed out that the organism must possess the ability to adapt to changing environment in order to survive. Medical sciences have demonstrated the fact of immunity and have illustrated some of the mechanisms by which the body maintains itself in health. These mechanisms have proved extremely complex and despite the thousands of research studies that have been conducted, they are not yet completely understood. However, each advancement of knowledge lends support to this basic pillar of osteopathic philosophy, and, at no time since Still's original pronouncement has it been seriously challenged.

The same advancements of knowledge have had a tendency to divorce principles from practice. In principle, the need for normal function in all the component parts and systems of the body is recognized and the interdependence of cellular activity in the production of normal body physiology is appreciated. The effort to understand the functions of the various parts of the body has produced thousands of independent studies of analytic nature. As a result, medical science has been broken up into separate parts, both as regards subject matter and method.[7]

The rapid development of information in divergent fields of medicine has led to the necessity for specialization. The practicing physician could not cope with the volume of new thought, theory, and fact that was being produced about the body and its diseases. He found it necessary to limit his interest to a single field, and as his knowledge of that particular field increased, he developed a therapeutic viewpoint which caused him to evaluate the patient and his disabilities in the light of that particular specialty.

Without doubt, specialization has expedited our understanding of the component parts of the body. Certainly we know more about the heart because many good and intelligent men have given their lives to the study of that organ. But there has developed a tendency to evaluate the heart rather than the patient. The same is true of all the various fields of specialization, in practise, in research, and even in medical education. The departments of anatomy, physiology, and chemistry often become so isolated that the student has difficulty in correlating them when attempting to understand the human being. Diseases are taught as entities, complete units from etiology through morphology, diagnosis, and treatment to prognosis. McBryde[12] points out that "One must admit that monographic development of the complete picture of a disease is an important means of medical education, but there are serious defects in a system which encourages us to force the ailing person into a compartment, no matter how poorly it may fit him."

The effort to obtain complete information about the component parts of the body and their diseases leads investigators from one new phenomenon to another and causes them to wander farther and farther away from the goal of understanding the human being as a whole. The result has been that the patient gets shunted from specialist to specialist for the thorough but unrelated study of his various parts and systems. He well may reach the end of the search with an empty purse, a sheaf of reports, and the same distress that initiated the procedure unless the specialists consulted remember that the patient is a physiologic unit.

The body possesses the inherent ability to maintain itself in health and recover from disease providing *all* its component parts and systems are functioning normally. This basic osteopathic principle provides the axis—the hub—the central core—through which the detailed study and expert management of specialists may be correlated toward establishing the highest possible efficiency in the physiologic unit. The osteopathic physician (whether engaged in general practice or in a specialty) must be constantly aware of the total picture. He must recognize that physiologic perversion in a part will affect total body function, and that normal function in any part of the body is dependent upon normal function in every other part.

The second basic principle under discussion recognizes the fact that the normal function of the various parts and systems of the body may be perverted or arrested by mechanical or structural disturbances. It is an accepted axiom that structure governs function, but this axiom is usually applied to gross structural changes and forgotten in the consideration of individual organs or individual cells. Structural abnormality in the pancreas, produced by changes in the islands of Langerhans so alters the function of the pancreas that it is unable to produce an adequate supply of insulin, and the disease process known as diabetes ensues. This is a common example of altered function resulting from altered structure at a microscopic level. The more familiar structural changes at the macroscopic level have to do with developmental anomalies, postural disorders, and atypical growths. The minor structural disturbances that occur in association with the many articulations of the body have been overlooked or ignored outside of the osteopathic school of medicine. Credit for the recognition of such joint perversions and their effect upon physiological harmony in the body belongs to Still.

The syndrome described as the "osteopathic spinal lesion" has defied adequate definition and is not completely understood even after extensive research. Burns[13] lays down the following criteria for the determination of experimental lesions in laboratory animals: "(1) Palpable disturbance of bony relations, with no evidence of trauma of the tissues. (2) Abnormal palpable qualities of adjacent soft tissues." She points out that subjective symptoms, such as discomfort, are not suitable criteria in animals. She also distinguishes between the "bony lesion" and other tis-

sue changes that are usually included in the general term "osteopathic lesion." Burns has observed hypermobility, decreased tissue tonus, and an increase in synovial fluid as the immediate results of lesioning. These conditions change in from 1 to 3 days, in experimental animals, to restriction of motion, hypertonicity, and decrease in the amount of synovial fluid associated with an increase in its viscosity. Petechial hemorrhages are observed in the lesion area, followed by the production of fibrous tissue.

In 1926, Amussen[14] reported a series of experiments which led him to believe that the lesion did not depend so much on a change in bony relationship, as upon strain to a ligament or ligaments which altered the relationship of their component fibers. He described an inflammatory process resulting from this intraligamentous change which created a disharmony in the nerve impulses arising from joint movement. He found that injury to local and remote tissues resulted from the disharmony so initiated and he pointed out that the reaction on the part of the tissues to direct or referred injury is the basis of all pathology.

Pearson[15] has described the lesion as follows:

> The osteopathic lesion represents a series of abnormal reactions resulting in or coming as the result of structural abnormality. The fact that many functional changes result is but a reasonable consequence.
>
> Briefly, the osteopathic lesion represents an area of relative acidosis affecting the tissues and organs innervated from the involved segment. The tissues carry an abnormal amount of water and we sense them as being edematous. We have hemorrhage into the tissues. Pressure effects are present, and bands of fibrin interlace and divide the muscle fibers. Segmentary areas are affected, as is the lesioned area, with a lowering of physiological function and protective agencies.

These three references, selected at random from many, serve but to illustrate the complexity of the problem and to demonstrate the reason that no adequate description of the lesion has yet evolved. Investigation continues to provide vast new fields of inquiry into the character and mechanics of the lesion. Inevitably, exploration of these new fields will lead to further basic osteopathic principles and increasing knowledge of the syndrome will provide better and better therapeutic weapons. The purpose of osteopathic research is not to prove the clinically recognized osteopathic lesion, but to improve our understanding of its mechanics and its control.

The basic principle that mechanical or structural disturbances occur in the body which interfere with, or impede, the normal functioning of certain of its parts or systems complements the first principle discussed and affords a foundation for the understanding of the loss of health in the individual. It leads, naturally, to the third principle under consideration: that such mechanical and structural disturbances can be recognized and understood and that it is possible to apply treatment which will overcome those disturbances or enable the body to compensate for them.

Since the days when Still first developed a clinical application of his philosophy, osteopathic physicians have recognized certain tissue changes on palpation and have identified them as osteopathic lesions. Clinical evidence of the physiological changes produced by these lesions has been carefully observed and the accumulated experience of the profession has produced accurate clinical interpretation of palpatory findings. Osteopathic physicians have developed this palpatory skill to a high degree and some of them have dramatized its value by refusing to listen to the patient's history, preferring to make palpatory examination and then describe the symptoms to the patient. While showmanship is not commended as sound professional procedure, such ability serves to emphasize the fact that mechanical and structural disturbances can be recognized and understood.

The interpretation of the clinical effects of osteopathic lesions changed the philosophy of the management of disease. Diagnosis by means of cataloguing and classifying the subjective symptoms of the patient was no longer satisfactory. The osteopathic physician sought the cause of disturbance in sensation and function through the interpretation of lesion patterns and, through his knowledge of anatomy and physiology, made serious effort to understand the perversion of function affecting the patient's health. This application of biologic thinking to the art of diagnosis gave clearer insight into the nature of the disorder.

Still[16] wrote: "To find health should be the object of the doctor. Anyone can find disease. He should make the grand round among the sentinels and ascertain if they are asleep, dead, or have deserted their posts, and have allowed the enemy to get into camp. He should visit all posts." In this statement Still pointed out the necessity to know the normal and to be able to appreciate the loss of normal. He also emphasized the interdependence of the component parts of the body in his directive to visit all the posts. He realized that a structural disturbance in one part of the body would cause physiological perversions throughout the body.

Laboratory technics for the determination of disease processes have been greatly improved since Still's statement was published in 1902. The facilities of the modern diagnostic laboratory make it possible for us to determine the precise character of tissue changes that were unrecognized at the turn of the century. Reliance on this aid has dulled our alertness to some extent, and we are prone to look for disease rather than health. It must be remembered that tissue changes are the result of disease processes. For example, by the time the erythrocyte count is down to three and one half million, the hemopoietic or hemolytic functions of the body have already become impaired. Arthritic changes seen on an x-ray film are evidence that the disease process has been active for some time. Some interference to normal function must have preceded the development of the tissue changes in these examples.

Ideal health care would be true preventive medicine, in which the beginning of the loss of health would be recognized, and normal physiology restored before tissue changes have progressed to the point of easy recognition. Still proclaimed that a disturbed artery marked the beginning of disease to the hour and minute; that the rule of the artery must be absolute, universal and unobstructed or disease will be the result.[17]

We are unable to detect perversions in circulatory values until they have produced disturbances in tissue function, but we must not lose sight of the goal of the earliest possible recognition of disease processes. The most reliable index to the physiological status of the patient is gained through the skilled palpatory sense, because the tactile sense will reveal disturbances before they have reached the patient's consciousness. Further progress in osteopathic research can be expected to provide an earlier recognition of the lesion

syndrome and other structural and mechanical disturbances that interfere with normal physiology, and to increase our knowledge of the precise manner in which they affect the body.

Northup[18] emphasizes the importance of the "preclinical" lesion—the lesion at an earlier stage than is recognized at present. His work with the autonomic nervous system has convinced him that lesioned states (other than traumatic lesions) develop gradually; that our present criteria in the recognition of lesions cause us to overlook many lesions at their inception; and that, as a result, we fail to combat disease during the time when treatment would be most effective.

Lack of adequate nutritional supply, obstruction in the elimination of the waste products of metabolism, perversion of nerve forces to produce either excessive excitation or inhibition, trauma from abnormal stress forces and the advent of chemical, physical, or psychic insult are factors capable of impairing normal function. The search for health leads to the discovery of these factors, whereas the search for disease presupposes well-developed and organized pathologies.

It is doubtful whether a solitary lesion exists as such. The compensatory forces brought into action by the existence of any mechanical or structural perversion establish compensatory lesions almost immediately. The forces that produce mechanical disturbances, whether they be direct or through reflex, can seldom be limited to a sufficiently fine focus to produce a single lesion. Therefore, it becomes necessary to "visit all the posts" in order to determine the true character of the existing lesion pattern and to understand its production.

As a system of practice osteopathy has become identified in the minds of the experienced public with certain manipulative procedures distinctive to this school of therapy. The clinical success of these procedures has proved that it is possible to apply treatment which will overcome perversions of body mechanics or enable the body to compensate for them.

In view of the first and second principles already discussed, it would seem obvious that the therapeutic approach must encompass the entire body. It was stated earlier that increasing knowledge in specific fields tends to divorce principles from practice. The physician who devotes his professional life to the greater understanding of a single physiological system or to the interpretation and management of a single lesion pattern may lose sight of the fact that the body is a unit; that changes taking place within his field of interest must, of necessity, affect the total body; and, conversely, that changes arising elsewhere in the body will have important bearing on his field. In a similar manner, the physician engaged in general practice must not accept evidence of a disturbance in body function at one area as comprising the total picture. A "visit to all the posts" will frequently open an avenue of therapeutic approach to conditions which seem unapproachable on unilateral analysis.

Treatment which will overcome mechanical or structural disturbances, or enable the body to compensate for them should include all methods of proved value. The osteopathic concept is universal in its scope. It encompasses the health problems of the human being and offers a sound basis of philosophy for the management of all diseases. While it is true that the therapeutic world is faced with many problems that have yet to be solved and that, because of our present lack of knowledge or because of the failure of cooperation on the part of the patient, certain disease processes become irreversible, it is also true that the osteopathic concept offers more toward the preservation and recovery of health than any other science or system known to man.

Because this value has been recognized by the experienced public, the word "osteopathic" has come to have definite meaning to them. They expect to receive the most nearly complete health care available at the hands of the osteopathic physician, whether he is engaged in general practice or in the specialties. They expect osteopathic institutions to supply the best in standard hospital or institutional service; and they expect the service of the departments of diagnosis, surgery, obstetrics, and all other therapeutic divisions to be strengthened and improved by the integration of the osteopathic concept. They anticipate, and are entitled to, a type and quality of health care that is distinctive to the osteopathic school of medicine. The rapidly growing appreciation of osteopathic service, as manifested by improved health laws and increasing numbers of osteopathic patients, bears evidence that just such service can be and is being rendered.

CONCLUSIONS

Three basic osteopathic principles have been reviewed briefly. They have been fundamental principles of our profession since Still made his first pronouncements 75 years ago. They are fundamental principles as we celebrate the Diamond Jubilee of our science. That fact is testimony of their soundness and their magnitude. We are now embarking on an era of research which may be expected to widen the vistas of osteopathy. Dare we look ahead and attempt to visualize the status of the principle 75 years hence?

A year ago an outstanding physiologist was asked what he believed to be the future of osteopathy. He replied that osteopathy is the future of medicine; that its concept is so sound, physiologically, that all schools of medicine must ultimately adopt its principles; and that it depends upon the profession whether we advance to that future or leave it to others.[19] Whether—and how—the profession meets the challenge will determine the future of the osteopathic profession, but *not* the survival of the osteopathic concept; *that* seems determined. Good ideas never die.[20]

1538 Sherbrooke St.

REFERENCES

1. Korr, I. M.: The neural basis of the osteopathic lesion. J. Am. Osteop. A. 47:191-195, Dec. 1947.
2. Still, A. T.: Philosophy of osteopathy. Published by the author, Kirksville, Mo., 1899, pp. 219-220.
3. Webster's New Twentieth Century Dictionary. The Publishers Guild, New York, 1947.
4. *Op. cit.*, ref. 2, pp. 24-25.
5. Thomas, R. B.: Lecture at Pennsylvania Refresher Course, 1949.
6. Drucker, D. E.: Referred pain and the osteopathic lesion. J. Am. Osteop. A. 47:623-629, Aug. 1948.
7. Speransky, A. D.: A basis for the theory of medicine. International Publishers, New York, 1944.
8. Academy of Applied Osteopathy Year Book. Edwards Brothers, Ann Arbor, Mich., 1945.
9. Ussher, N. T.: The viscerospinal syndrome. Ann. Int. Med. 13:2057-2090, May 1940.
10. Wilbur, R. L.: Medical education today. J. Am. M. A. 124:815-816, Mar. 25, 1944.
11. Lecomte du Noüy, P.: Human destiny. Longmans, Green & Co., New York, 1947.

12. McBryde, C. M., ed.: Signs and symptoms. J. B. Lippincott, Philadelphia, 1947, p. vii.
13. Burns, L.: Pathogenesis of visceral disease following vertebral lesions. American Osteopathic Association, Chicago, 1948, p. 6.
14. Amussen, J. S.: The scientific basis of osteopathy. J. Am. Osteop. A. 26: 101-108, Oct. 1926.
15. Pearson, W. M.: Osteopathic principles in the light of modern science. J. Am. Osteop. A. 32:299-305, April 1933.
16. Still, A. T.: The philosophy and mechanical principles of osteopathy. Hudson-Kimberly Pub. Co., Kansas City, Mo., 1902, p. 72.
17. Still, A. T.: Autobiography. Published by the author, Kirksville, Mo., 1897.
18. Northup, G. W.: Lecture to the Canadian Osteopathic Association, 1945.
19. Korr, I. M.: Personal interview, June 1948.
20. Korr, I. M.: Emerging concept of the osteopathic lesion. J. Am. Osteop. A. 48:127-138, Nov. 1948.

Hyperproteinization
Use in Rheumatic Fever

ROBERT C. THOMAS, D.O.
Duncan, Ariz.

During the past several years a great deal of experimental evidence has accumulated relative to the many body changes associated with protein depletion and to the utilization of a hyperproteinization regimen to combat the rather severe pathological and physiological changes brought about as a result of an inadequate intake of protein substances.

In a rural practice such as the one in which I am engaged, it is practically impossible to evaluate by detailed laboratory procedures the precise mechanisms of the changes wrought in body metabolism and blood chemistry. Thus in the discussion of cases that I will present, the criteria have been of necessity based on the evaluation of purely clinical response to the use of a greatly increased intake of protein substance as a major form of therapy.

Heretofore large amounts of protein have been administered on the premise that the individual was in a moderate to severe state of depletion such as is found in certain phases of the starvation syndrome, either compulsory or experimental,[1] or in selected postoperative or cancerous conditions.

Recently the trend of experimental investigation in this field of nutrition has been directed toward the more acute phases of disease. Nonhealing ulcer formations have tended to heal rapidly and completely on a high protein regimen when all other forms of therapy have failed. These results can be evaluated on the assumption that the specific dynamic action of excess proteins increases vasodilation in the tissue and hence furnishes a more adequate blood supply, which is essential to any tissue repair.

With this thought in mind, I would like to discuss in a general way the essential functions which the protein substance performs in the control of disease processes, namely:

1. Hepatic detoxifying mechanisms are supported by individual amino acids in the protein digest.
2. Immune bodies are formed by the reticuloendothelial system from the amino acids of protein digest.
3. The specific dynamic action of excess protein metabolism increases vasodilation in the tissues and hence aids in providing adequate blood supply.
4. A good protein supply stimulates adrenal cortical activity without which there is no adequate response to disease.[2]

A series of eight cases of rheumatic fever was treated by hyperproteinization. The ages of the group ranged from 9 to 17 years. All cases exhibited enough of the major and minor diagnostic criteria to allow precise and accurate diagnosis.

Using the previously mentioned four point rationale as a basis for treatment, a hyperproteinization therapy was instituted for each case. For the first 7 days each patient received an adequate amount of an intravenous amino acid preparation. At the end of this period when the patients had responded and temperature, pulse, and sedimentation rates were returning to a more normal level, oral therapy was instituted.

It has been found that after ingestion of traditionally cooked food, it takes from 2 to 3 hours for the amino acid levels to reach peak. With protein hydrolysate, peak is reached in from 30 to 45 minutes. With a protein concentrate the peak is reached in 1 to 1¼ hours. By proper spacing of the feedings this peak absorption can be held at high levels for some 16 hours a day, maintaining a higher potential between blood and tissue than is possible with traditionally prepared foods.[3]

A protein concentrate (Provimalt-Humanic Brands) was used, starting at a level of 100 grams per day and increasing the amount as tolerated up to 300 grams daily. This level was maintained for 60 days. At the end of that time all patients were free of fever and the essential laboratory tests were normal. In seven of the eight patients all of whom had had moderate to severe cardiac enlargement with apical systolic murmurs, this symptom was no longer apparent. The eighth patient developed subacute bacterial endocarditis and still had a pronounced cardiac lesion but was otherwise symptom-free.

There had been a rapid weight loss during the onset of rheumatic fever, with an average of 15 to 20 per cent loss. This loss had been made up at the end of 15 days of intensive therapy and each patient had gained an average of 15 pounds over his normal weight by the time he had advanced to moderate exercise.

In all eight cases there was a moderate to severe secondary anemia. Results of blood examination were found to be normal in all phases after 15 days of high protein intake.

The rather dramatic results gained in the treatment of this relatively small group of cases brings to attention the fact that we are really just beginning to understand the extremely vital problems of nutrition in relation to body health and disease. Heretofore nutritional and supplementary feedings played a minor role, while now it is becoming increasingly evident that modern therapy must and is accepting hyperproteinization as one of the powerful tools at its disposal for the treatment of many disease entities.

Box 73

REFERENCES

1. Co Tui: Clinical experiences with the oral use of protein hydrolysates. Ann. New York Acad. Sc. 47:359-373, Oct. 30, 1946.
2. Kline, A. P.: Personal communication.
3. Keys, A.: Human starvation and its consequences. J. Am. Dietet. A. 22:582-587, July 1946.
4. Mollison, P. L.: Observations on cases of starvation at Belsen. Brit. M. J. 1:4-8, Jan. 5, 1946.

Anomalous Auriculoventricular Excitation
The Wolff-Parkinson-White Syndrome

RUDOLPH GERBER, D.O.
New York

Anomalous auriculoventricular excitation is characterized in the electrocardiographic tracing by a short P-R interval of 0.1 second or less and an increase in duration of the QRS of 0.1 second or more which is slurred. The ascending limb of the QRS complex is slurred and slow while the descending limb is rapid and normal.

While this syndrome is said to exist most frequently in young males, it may be found at any age and has been found in individuals as young as 14 weeks of age and as old as the seventies. These individuals, who show a definite tendency to paroxysmal tachycardia, are otherwise normal. This supposedly rare syndrome would undoubtedly be discovered more frequently if every case of paroxysmal tachycardia were investigated more fully.

The mechanism is explained as being due to a congenital anomaly consisting of the existence of an accessory pathway of auriculoventricular conduction. The stimulus proceeding along the abnormal pathway reaches the ventricles more rapidly (short P-R) causing early activation of the latter. The stimulus that follows the normal pathway reaches the ventricles later, contributing to the second part of the QRS complex.

Kent[1] in 1893 was the first to demonstrate atrioventricular muscular connections in mammalian hearts. He later contradicted the concept of a single atrioventricular connection but maintained that there were other connections besides the bundle of His, particularly one in the right lateral portion of the human heart which has come to be known as the "bundle of Kent." The syndrome under discussion also bears his name, being referred to as the "bundle of Kent syndrome."

Wolff, Parkinson, and White[2] in 1930 described the first series of cases showing a picture of bundle branch block and short P-R interval. The syndrome has commonly come to be referred to by their names.

Definite evidence has not yet been established that these anomalous atrioventricular connections exist only in hearts which reflect the syndrome. The mere presence of such a pathway may not necessarily insure its constant functioning. (Case 2 illustrates this.) Tracings taken by Roth and Doff[3] have exhibited shifts from normal to anomalous conduction and back again, which would seem to show that the discovery of the existence of anomalous auriculoventricular excitation may require more than one routine electrocardiogram.

In 1940 Hunter, Papp, and Parkinson[4] collected 109 cases exhibiting the Wolff-Parkinson-White syndrome. In 19 per cent of their cases they found co-existent organic heart disease, such as hypertension, coronary thrombosis, mitral stenosis, or syphilitic or rheumatic heart disease. In the treatment of these diseases, this syndrome, while of no consequence in normal hearts, assumes importance, since patients with it are especially susceptible to paroxysms of rapid supraventricular rhythms. In the diseased heart such paroxysms may result in complications as serious as congestive failure or even death.

When coexistent with infarction, the presence of early R waves may obscure the Q waves otherwise present. In suspected cases, quinidine may be necessary to induce periods of normal contraction. If this cannot be accomplished, to diagnose infarction may be impossible.

CASE REPORTS

Case 1. Female, aged 18, white, entered the cardiac clinic complaining of palpitations (paroxysmal tachycardia), slight dyspnea, occasional faintness, and fatigue. Blood pressure measured 128 systolic, 60 diastolic. Vital capacity was 100 per cent. Auscultation revealed a systolic murmur. Fluoroscopy was entirely negative. Cardiography revealed a short P-R interval of 0.08 second and a widened QRS of 0.12 second. (Fig. 1).

Note the typical slurring of the ascending limb and the sharp, normal character of the descending limb.

Case 2. Female, aged 34, white, entered the cardiac clinic complaining of precordial pain, shooting in nature and unrelated to exercise or eating; moderate dyspnea; and occasional bouts of palpitation (paroxysmal tachycardia). The history was otherwise negative as to cardiac symptomatology. She has a history of diphtheria and scarlet fever without complications.

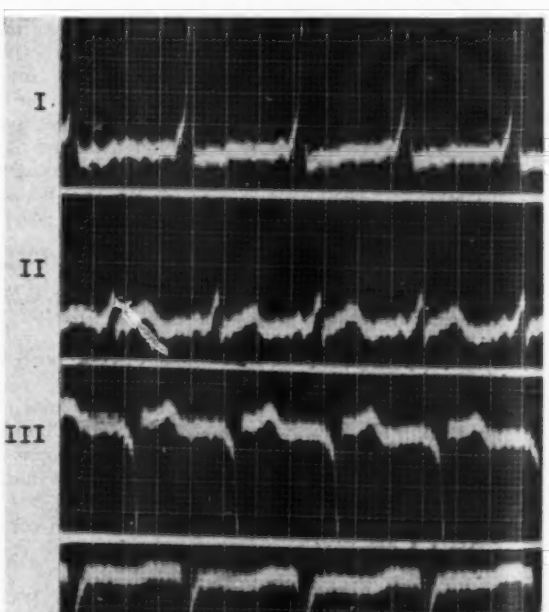


Fig. 1. Wolff-Parkinson-White syndrome in a normal heart.

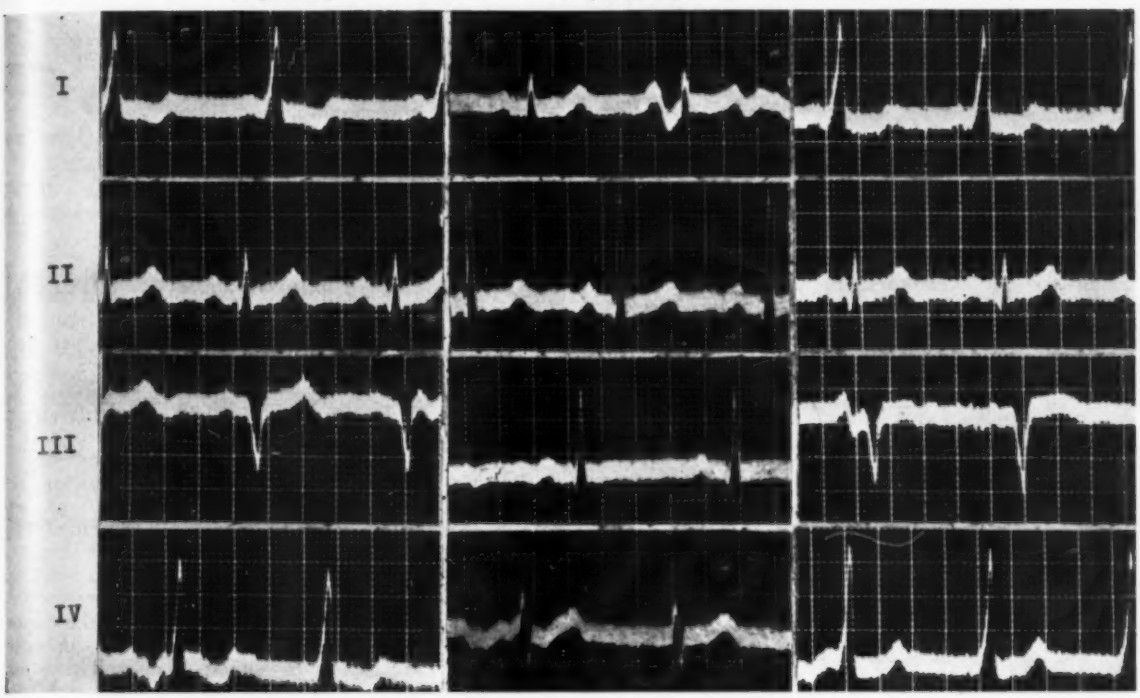


Fig. 2. Wolff-Parkinson-White syndrome and probable rheumatic heart disease. Composite of electrocardiograms recorded at various times for comparison of normal (B) with anomalous (A and C) atrioventricular excitation.

At 7 and at 23 years of age she had bouts of rheumatic fever which she claims caused cardiac complications. Blood pressure was 110 systolic, 70 diastolic. Auscultation revealed a harsh systolic murmur at the apex. The cardiac shadow was negative on radiography. Exercise tolerance tests were negative.

This case is particularly interesting in that it not only shows a shift from anomalous to normal conduction and back again but also reveals the relatively rare association of the Wolff-Parkinson-White syndrome with rheumatic heart disease. The electrocardiogram (Fig. 2) illustrates how the ordinarily prolonged P-R of the latter will modify the ordinarily short P-R of the former and explains why the otherwise typical graph (A) of a Wolff-Parkinson-White syndrome shows a P-R interval exceeding 0.1 second (from 0.12 to 0.16 second) though never quite approaching the 0.2 second of the graph (B) which reveals the usual conduction. It is possible that, providing the shift is not complete, the P-R interval of the "normal" graph (B) has been modified by the anomalous excitation and would otherwise have been of longer duration.

SUMMARY AND CONCLUSIONS

1. Two cases illustrating anomalous auriculoventricular excitation (Wolff-Parkinson-White syndrome), one associated with rheumatic heart disease, are reported.

2. This syndrome, though giving the appearance of bundle branch block and organic heart disease, is, on the contrary, an anomalous but otherwise normal condition due to accessory conduction.

3. The added significance of this syndrome when associated with organic heart disease as well as its importance in masking the pathological condition is stressed.

4. The syndrome, a supposedly rare phenomenon, is more common than is usually believed and, if looked for in cases of paroxysmal tachycardia of unknown etiology, would undoubtedly be discovered with greater frequency.

11 E. 48th St.

REFERENCES

1. Kent, A. F. S.: Researches on the structure and function of the mammalian heart. J. Physiol. 14:233-254, 1893.

2. Wolff, L., Parkinson, J., and White, P. D.: Bundle-branch block with short P-R interval in healthy young people prone to paroxysmal tachycardia. Am. Heart J. 5:685-704, Aug. 1930.

3. Roth, O., and Doff, S. D.: Electrocardiograms of an unusual pattern in a patient with anomalous auriculoventricular excitation. Am. Heart J. 38:614-622, Oct. 1949.

4. Hunter, A., Papp, C., and Parkinson, J.: Syndrome of short P-R interval, apparent bundle branch block, and associated paroxysmal tachycardia. Brit. Heart J. 2:107-122, April 1940.

ADDITIONAL REFERENCES

Kistin, A. D.: Observations on the anatomy of the atrioventricular bundle (bundle of His) and the question of other muscular atrioventricular connections in normal human hearts. Am. Heart J. 37:849-867, June 1949.

Kistin, A. D., and Robb, G. P.: Modification of electrocardiogram of myocardial infarction by anomalous atrioventricular excitation (Wolff-Parkinson-White syndrome). Am. Heart J. 37:249-257, Feb. 1949.

Linn, G. C.: Case of Wolff-White-Parkinson syndrome with electrocardiographic changes and attack of supraventricular tachycardia controlled by quinidine. New York State J. Med. 48:917-918, April 15, 1948.

Luisada, A. A.: Heart. Williams & Wilkins Co., Baltimore, 1948, pp. 360-361.

Rinzler, S. H.: Coexistence of Wolff-Parkinson-White syndrome and organic heart disease. New York State J. Med. 48:1617-1619, July 15, 1948.

Wood, F. C., Wolferth, C. C., and Geckeler, G. D.: Histologic demonstration of accessory muscular connections between auricle and ventricle in case of short P-R interval and prolonged QRS complex. Am. Heart J. 25:454-462, April 1943.

The Early Diagnosis of Cancer*

DORSEY A. HOSKINS, D.O.,
Professor of Pathology
Kansas City College of Osteopathy and Surgery
Kansas City, Mo.

Realizing that the subject is much too large to be thoroughly discussed in one paper, I propose to review the nature of cancer, its earlier manifestations, and obstacles in the way of early diagnosis, with some suggestions for overcoming them. Cancer is the second cause of death and many patients who die from other causes have cancer. Most cancers occur after the age of 50, but no age is immune. In my series of 350 autopsies, 19 per cent died of cancer. Many more cases have been diagnosed by biopsy.

Most forms of cancer are insidious and stealthy in onset so that the patient is often blamed for the delay in diagnosis. Better public health education, which would teach victims to suspect the condition and apply for diagnosis, might be a partial remedy. Education cannot be the whole remedy because many forms of internal cancer have grown considerably before they are brought to the conscious mind of the patient.

The symptoms of early cancer are not pathognomonic and the possibility of cancer may not occur to the physician; examination may not be thorough and the patient may be treated palliatively and symptomatically. During this time, the malignancy is spreading according to the nature of the particular tumor. No physician can make a diagnosis unless the entity crosses his mind.

It is obvious that the responsibility of the early diagnosis of cancer is largely that of the general practitioner. It is also obvious that once the diagnosis is made many physicians are more likely to think of therapeutic failures rather than of the possibilities of arrest of the growth or other benefits from treatment.

No doubt, the osteopathic colleges could present the subject of oncology, the second cause of death and much suffering, in a more concentrated course. At present, the student acquires a general idea of the subject in pathology and more specific ideas in dermatology, urology, gynecology, surgery, and other courses. On the whole, the teaching is presented in a rather scattered manner. While the curriculum is already crowded, the need for knowledge concerning tumors is great; the writer knows of no subject that is more puzzling to the physician.

Pathologists are scarce; there is only one to every ten or fifteen osteopathic hospitals. It is urged that more pathologists be trained by the already existing qualified laboratories.

The physician should be more familiar with the nature of cancer and the points in its diagnosis. The biopsy specimen should be taken from the cancerous area rather than from the adjacent area. In some instances, the specimen includes only the secretions of the inflamed or cancerous tissue; of course, the pathology report will be, "No cancer cells seen." The tissue of the biopsy should be placed in 10 per cent formalin immediately on removal. When tissue dries before being placed in solution, the cells will not stain differentially and cancer cells may not be seen even though they may be present.

A more adequate method of consultation between the family physician, surgeon, radiologist, and pathologist should be established. The pathologist is frequently confronted with a piece of tissue in 10 per cent formalin without information as to location, attachments, encapsulations, size, duration, or character of growth before removal and without knowledge as to age, sex, or physical condition of the patient, and is asked to state whether it is malignant or not. He is also asked to suggest or outline treatment and to make a prognosis as to the amount of dysfunction and suffering to expect and to estimate the duration of life. To assume that the pathologist has such all-embracing abilities is absurd. It is the right, duty, and privilege of the pathologist to examine the tumor before surgery in order that he may know more accurately the nature of the tissue he is about to study microscopically. Correspondence is a poor method of consultation just as the telephone is a poor instrument for physical diagnosis. More and better trained pathologists, radiologists, and surgeons, with better understanding of each other's problems and of those of the family physician are needed; family physicians alert for the detection of cancer are needed; education of the public concerning cancer is needed—all to the end that a higher percentage of cancers will be diagnosed earlier.

Selection of the proper treatment of the cancer that has been diagnosed early should be a matter for continued consultation. The pathologist can classify and state the nature and degree of differentiation of the malignancy. The general rule is that the more differentiated a tumor is the more radioresistant it is. The surgeon and radiologist should be coworkers in the treatment of cancer.

The exact nature and causes of cancer are still unknown but it is very wrong to believe that the vast amount of research and accumulated information concerning it are of no value. While no single factor has been proved the cause of cancer, infections, irritations, trauma, carcinogenic hydrocarbons, sex hormones, heredity, age, and other factors have been implicated. It is likely that the causes of cancer are as numerous as the causes of inflammations; that many factors acting concurrently, in the proper proportions, and over a sufficient length of time will result in cancer. Misplaced tissues as embryonal rests, due to errors in development, undergo malignant change more frequently than tissues in their correct anatomical relationship to other tissues of the body. Misplaced tissue may have no function or perverted function. If cells do not function, they do not differentiate. If they do not differentiate, growth is unopposed. Thus we account for the undifferentiated growths from embryonal rests.

There is a fundamental change in the metabolism of a malignant cell. It no longer needs oxygen. It requires glycogen which it converts into lactic acid:

*Presented at the annual meeting of the Montana Osteopathic Association, Billings, June 5-7, 1950.

a normal asphyxiated cell acts in the same way. Why a cell that formerly consumed oxygen and gave off carbon dioxide changes its metabolism so that it demands glycogen only to change it into lactic acid is unknown. If this one fact were understood we might be more likely to come to an understanding of the real nature of a tumor.

A malignant tumor will cause death regardless of its anatomical location, if not adequately treated. It grows rapidly causing local destruction of tissue. It metastasizes, causing destruction in its new location. The liver is a frequent site of metastasis and may be almost completely destroyed from the pressure of the expanding tumor. Foreign proteins, some of the by-products of the destroyed tissue, enter the circulation and poison all the tissues of the body. Their functions are perverted to the degree that they are poisoned. For example, the red bone marrow is depressed and anemia results. The tumor outgrows its blood supply and undergoes necrosis, further adding to the soluble toxins of the body.

Tumors and tissues adjaeent to a tumor are invariably inflamed. Evidently the malignant cells act as an irritant to the surrounding tissues and the inflammatory reaction is a defensive measure. Sometimes, the inflammation advances to the point of suppuration. These inflammatory processes augment the toxemia.

Progressive secondary anemia contributes much to death in malignancy. The soluble and circulating toxins from the infected, ulcerated, and necrotic tumors damage the bone marrow and produce hemolytic agents. The cancer patient has anorexia and part of the anemia is due to lack of proper nutrition. On ulcerated surfaces, the blood is lost because of eroded vessels. Because of the thin walls of the newly formed vessels in a tumor, together with necrosis and inflammation, there is hemorrhage into the tumor and surrounding tissues. This extravasated blood is lost as truly as if it had been set free on a bodily surface. Anemia is produced due to reduced blood formation and increased blood destruction. Anemia may be a late symptom in malignancy.

Even in malignancies outside the gastrointestinal tract, malnutrition, sometimes to the point of starvation, contributes much to death. The toxemia, anemia, and pain will result in the loss of appetite with poor absorption and assimilation of food. Sometimes, the patient with cancer, tempted by appetizing food, may feel that he can eat, only to be seized by a terrific pain that makes him lose any semblance of appetite. Interpretation of the above pathological changes easily accounts for the loss of weight and strength in malignancy, which are important points in the diagnosis, but too often, they appear late in the course of the disease.

When the malignancy involves the gastrointestinal tract, the factors of obstruction, stagnation, fermentation, and putrefaction are added, and the course toward death is hastened.

Obstruction of natural passages by malignancy may produce death before severe systemic disturbances mentioned above can occur. For example, cancer of the head of the pancreas may block the bile ducts, resulting in jaundice and insufficient bile in the intestines; cancer of the cervix of the uterus may occlude both ureters causing urinary retention; or annular carcinoma of the colon may cause intestinal obstruction.

Only a few of the more obvious and outstanding ways that malignancy produces death have been mentioned, but certainly enough to prove that a malignant tumor will produce death, regardless of anatomical location, unless adequately treated. The modifying provision — unless adequately treated — embodies the only hope of the physician to help the patient. It follows that malignancy cannot be adequately treated until diagnosis is made. A late diagnosis is of limited value to the patient. After loss of weight and strength are obvious, the diagnosis is likely to be of the late classification with spread of the tumor beyond operative fields. Early diagnosis, with proper choice of treatment, is the only effective approach to cancer.

UTERINE CANCER

Most authorities agree that the uterus is the most frequent site of malignancy in the female. The percentage of the total of malignancies varies from 22 to 38 per cent, according to the clinic making the estimation. About 10 per cent of uterine cancers originate from the endometrial glands of the fundus and the remaining 90 per cent in the cervix. The large majority of cancers of the cervix originate from the stratified squamous epithelium of the portio vaginalis and are known as squamous-cell carcinomas.

If the physician is well aware of this high incidence of cancer of the cervix, he may frequently be able to diagnose it in its incipiency. Ninety per cent of carcinomas of the cervix occur in women who have borne children. Even the minor lacerations, abrasions, and trauma inevitable in childbirth are sufficient to allow pathogenic bacteria to invade the cervical glands and stroma. The resulting chronic inflammation causes glandular proliferation with mucopurulent secretion and fibrosis. The excoriating secretions, or other factors, cause maceration and ulceration of the stratified squamous epithelium at the external os leaving a raw surface which the columnar epithelium of the endocervix quickly covers. The vascular stroma shines through this area causing redness about the external os. The stratified squamous epithelium becomes hyperplastic and may invade and occlude the glands and may be mistaken for carcinoma of the cervix. This condition of chronic cervicitis is so frequently followed by squamous cell carcinoma that it is considered a precancerous lesion by many clinicians and pathologists.

The stratified squamous epithelium of the portio vaginalis, so easily destroyed in chronic inflammation, may remain displaced by the simple epithelium for a variable length of time. However, it may become anaplastic and start invasion of the stroma of the cervix with a malignant vengeance.

It is difficult to differentiate between chronic cervicitis and incipient carcinoma. One of the earliest signs of cancer is bleeding. According to Novak,[1] the lesion is only suspicious in appearance and diagnosis can be made only on biopsy and microscopic examination. At first the tumor is small and grows locally. The anaplastic epithelium finally invades the glands and stroma of the cervix and almost completely destroys it. It invades the bladder, rectum, and vagina by direct extension and infiltration. It metastasizes to the retroperitoneal lymph nodes. I have seen metastases in the liver. The cervical cancer is always chronically inflamed, and sometimes acutely inflamed. The lesion is friable, hemorrhagic, and necrotic. The odor of the secretions is offensive. At this time, the

diagnosis can be made by physical and clinical examination but it will be too late to be of value to the patient. The diagnosis of the precancerous lesion of cervical erosion or incipient carcinoma is much more valuable than the diagnosis of advanced carcinoma.

Adenocarcinoma of the body of the uterus arises from the endometrial glands. It usually occurs after the menopause, and according to Boyd,[2] is more common in nulliparae. Uterine bleeding may be the first sign. This cancer forms a papillary mass within the uterine cavity and infiltrates the myometrium. Sometimes the uterus is not greatly increased in size but there may be great enlargement with invasion into the fallopian tubes. The tumor may remain within the uterine cavity for a considerable time but will finally spread through the uterine wall and to the regional lymph nodes by way of the lymphatics and to the liver and lungs by way of the blood.

I have found sarcoma in the myometrium and in myofibromata in a small percentage of cases. The symptoms are not pathognomonic. Bleeding may be absent if the endometrium is not involved. According to Novak,[1] the diagnosis is not made until operation or, even more frequently, until pathological examination. The uterus is enlarged and asymmetrical but the serosal covering may be smooth. On cut gross section, the sarcomatous areas are soft with hemorrhagic areas and homogeneous, lacking the whorl-like appearance of a myofibroma or the fasciculi of a normal uterus. On microscopic examination, the malignant cellular structure is demonstrated. In the history of one of my cases, there was nothing that pointed to sarcoma of the uterus. The uterus was removed with a surgical diagnosis of myofibroma and the sarcoma was diagnosed in the pathology laboratory. Radiation was administered but x-ray showed involvement of the lungs and death was rapid.

MAMMARY CANCER

Cancer of the breast constitutes from 21 to 40 per cent of the total number of cancers in the female, according to the clinic making the estimation. The highest age incidence is from 50 to 55 years of age, but the incidence is high from 30 to 75. According to Ewing,[3] the known causes of mammary cancer are rather well established as referable to endocrine disturbance and long stagnation of secretion.

Scirrhous carcinoma is the most frequent type of cancer of the breast. It begins as a single small nodule, located most frequently in the upper outer quadrant of the breast. It causes no discomfort early. Therefore, it has usually grown considerably before being brought to the consciousness of the patient. It is very hard and adherent to the fascia of the breast. If it is near the dermis, it is adherent to the skin. If it is deep in the breast tissue, skin involvement will be late. It is circumscribed but not encapsulated. It cannot be enucleated by the surgeon. The drawing force of the sclerotic tissue will finally be felt throughout the entire fibrous framework of the breast and will cause invagination of the nipple, even though it is a considerable distance from it. It is immovable within the breast; that is, when it moves, the entire breast moves with it. When removed, it may be as small as a pea or 1 to 2 inches in diameter. It cuts with the gritty feel of an unripe pear. It is white or yellowish and sclerotic.

The extensions may be seen grossly into the adjacent breast tissue. There is early permeation of the lymphatics with metastasis to the regional lymph nodes which are located in the axilla, in the fascia of the pectoral muscles, under and above the clavicle, and beneath the sternum. The great and difficult question is: Have metastases occurred? Of course, if metastatic growth is advanced the answer is obvious, but a few malignant cells may be in the lymph nodes without discernible enlargement. Also, the lymph nodes may be enlarged from chronic inflammation associated with the tumor, or from chronic mastitis of lobular hyperplasia. According to Bell,[4] over two-thirds of the cases show axillary metastases at the time of operation.

One of the most difficult conditions to differentiate from carcinoma of the breast is lobular hyperplasia. This condition is due to an imbalance between functional hyperplasia and involution which, in turn, is due to an imbalance of the ovarian hormones that control these physiological processes. This condition may occur in young women suffering from hypo-ovarianism, but is more common in women whose breasts have undergone repeated hyperplasia and involution from pregnancy and lactation. These lesions are diffuse, indurated, and tough with an india-rubber consistency and with margins fading away into the surrounding tissue.

It is certainly wrong to sacrifice the breast of a young woman by surgical removal in lobular hyperplasia. It is amenable to osteopathic manipulative treatment directed to the endocrine system, especially the ovaries and pituitary. Some pathologists and clinicians consider lobular hyperplasia occurring at about the time of the menopause as a precancerous lesion. If it is, the removal is certainly justified. I have found scirrhous carcinoma developing in a narrow area of a tumorous mass, with lobular hyperplasia about it. According to Bell,[5] "Carcinoma may develop in a cystic breast, but it does not appear to do so oftener than in the normal breast of women of corresponding age."

Lumps in the breast are puzzling to clinicians and surgeons. Possibly a quotation from Boyd[6] is fitting: "Prior to operation, no surgeon in the world can be certain that a localized lump in the breast is not carcinoma, however innocent it may appear to be."

The physician should have constantly in mind the fact that cancer of the breast and uterus constitute more than one-half of the total cancers of the female.

GASTRIC CANCER

The stomach is probably the most frequent site of cancer in the male and is not infrequent in the female. About one-third of malignancies are of the stomach. The highest age incidence is 61 years but the incidence is high from 45 to 75 years. Most of the cancers originate in the pylorus, with the remainder about equally divided between the lesser and greater curvatures.

As with other malignancies, cancer of the stomach is insidious in onset, and there are no early pathognomonic symptoms. It is likely that the tumor has grown considerably before it has caused sufficient alteration in structure to result in enough dysfunction to be brought to the consciousness of the patient. There may be a slight dyspepsia or a change in appetite, as satiety after a small amount of food. Ordinarily patients will endure such slight discomfort without applying to the physician. A physician, presented with these vague complaints, may regard them lightly and treat them palliatively. During all this time the tumor is growing locally, infiltrating the wall of the stomach,

and perhaps being carried by the lymph stream to the regional lymph nodes.

X-ray studies of the stomach may reveal the tumor. Pain may be late, as it depends on the irritation and destruction of the muscular layer. Absence of free hydrochloric acid is inconstant. Lactic acid depends on food decomposition and pyloric obstruction. Blood in the stool is *constant* as capillaries, and even larger vessels, are eroded in the ulcerative growth. There will be anemia, usually of the hypochromic microcytic type. It may resemble the pernicious type, but the icterus index will not be raised. A part of the anemia may be due to the inability of the stomach to make the intrinsic factor, a part of the antianemic principle of the liver.

The tumor may form a papillary growth extending into the stomach. It may be excavating or it may infiltrate the gastric wall. Finally, it may invade the serosal coat, omentum, or mesentery, and implants may be studded over the peritoneal surfaces. I have seen one patient in whom the mesenteric attachments of the small intestine were invaded with resulting sclerosis and shortening and limited movement of the intestines. This type of lesion causes stasis within the intestine. The patient referred to above died of diffuse generalized peritonitis. In another patient, the malignant tumor invaded the retroperitoneal tissues and obstructed the pelvis of the left kidney. Such tumors metastasize to the lymph nodes about the stomach and to the thoracic and cervical nodes. In all the cases I have seen carcinomatous nodules were found in the liver.

PROSTATIC CANCER

The highest age incidence of carcinoma of the prostate is from 60 to 70 years. Latent or unsuspected carcinoma of the prostate is found in a high percentage of cases past 50 years of age. Ewing says,[3] "A markedly indurated prostate, in a man past 50 years of age, producing urinary retention is highly suspicious of carcinoma, especially if it is very hard and not very large." I have found cancers of the prostate that had not involved the urethra or caused enough urinary retention to be included in the clinical history.

Prostatic cancer begins insidiously and is usually located in the posterior lobe. Evidently, it has grown considerably before it causes the patient to seek advice. Even at the first examination, it is common to find invasion of the bladder, urethra, seminal vesicles, rectum, omentum, or bony pelvis.

The malignant tumor is dense and indurated; its capsule is thick and hard; it cuts with a gritty sensation and the cut surface will be flat or retracted and dry. The cut surface is not lobulated, as in benign hypertrophy, but more homogeneous. The tumor may be small and localized, but with early and widespread metastases. It may be a massive local lesion and spread may occur late. Routine examination of the prostate in every man past 45 years would result in the diagnosis of cancer of the prostate in a part of the 70 per cent who had never complained.

CONCLUSIONS

Only a few of the most frequent malignancies have been superficially reviewed, but the combined number of cancers of the uterus, breast, stomach, and prostate constitute the majority of the total number of cancers. Other malignancies encountered in the laboratory of the Kansas City College of Osteopathy and Surgery have been osteogenic sarcoma, basal cell carcinoma, squamous cell carcinoma of the skin and mucous membranes, carcinoma of the urinary bladder, pancreas, gallbladder, thyroid, lungs, nasopharynx, kidneys, Wilm's tumor of the kidney, the leukemias, malignant melanomas, and seminomas.

These malignancies have many characteristics in common as outlined in the introduction of this paper. It is noted that all are insidious in onset and have grown considerably before being brought to the consciousness of the patient and that they require the great diagnostic acumen of the doctor. It is noted that no age is immune. The age limits in my series have been from 4 to 91 years.

In order that the earliest possible diagnosis of cancer be made to the end that proper treatment results, it is necessary to remember and constantly bear in mind the following:

Cancer of the breast frequently begins as a single nodule and spreads early by the lymphatics to the regional lymph nodes.

Carcinoma of the cervix follows chronic cervicitis, which follows cervical lacerations. One of the earlier signs is spontaneous bleeding.

Beginning cancer of the prostate is frequently symptomless and it can often be diagnosed by digital examination through the rectum in patients who have never complained.

Painless hematuria may be the first sign of cancer of the bladder or kidney.

The earliest sign of carcinoma of the stomach may be change in the appetite or eating habits.

Wilm's tumor of the kidney is the most common malignant tumor of childhood and is not accompanied by hematuria or renal insufficiency.

A rapidly growing nevus may be a malignant melanoma.

Adenomatous polyposis of the rectum is a precancerous lesion.

Basal cell carcinoma is frequent on the face and can be treated with good results by both surgery and x-ray.

Injury to the knee joint in youth followed by a tumorous growth may be an osteogenic sarcoma.

No physician can make a diagnosis of anything until the entity occurs to him.

Finally, it must be remembered to make thorough physical examination routinely, with the possibility of cancer in mind, to the end that a higher percentage of lesions be diagnosed in the precancerous stage or as cancer in its incipiency.

534 Gladstone Blvd.

REFERENCES

1. Novak, E.: Gynecological and obstetrical pathology. Ed. 2. W. B. Saunders Co., Philadelphia, 1947.

2. Boyd, W.: Text-book of pathology. Ed. 4. Lea & Febiger, Philadelphia, 1943, p. 671.

3. Ewing, J.: Neoplastic diseases. Ed. 4. W. B. Saunders Co., Philadelphia, 1940.

4. Bell, E. T.: Text-book of pathology. Ed. 6. Lea & Febiger, Philadelphia, 1947, p. 395.

5. *Op. cit.*, ref. 4, p. 769.

6. *Op. cit.*, ref. 2, p. 712.

Surgical Principles*

ROSS B. THOMPSON, D.O., F.A.C.O.S.
Glendale, Calif.

One of the most important factors confronting the surgical team is a complete understanding of those principles upon which the foundation of surgery is built. This discussion will be a review of the principles of general surgery with the intention of simplifying routine procedures associated with surgical practice.

Thorek[1] has stated that the prime objective of surgery is to restore the patient to efficiency without, if possible, the loss of functioning tissue of value. This, of course, could be construed as an osteopathic principle inasmuch as we who are osteopathic surgeons are dedicated to the proposition of conservatism in all surgical principles. In fact, it might be said that it is the best surgeon who adopts a conservative attitude and spares the patient the ordeal of surgery as long as there is reasonable hope of attaining the desired results by less drastic measures. Axiomatically, it might be said that it is more to the surgeon's credit to avoid an operation than to perform it.

However, such a course is not always possible and according to Bickham[2]: "Timidity [in operating] is practically always an expression and confession of ignorance—often an ignorance as to the surgical pathology, but much more frequently an ignorance of pure anatomy." On occasion the most radical surgical procedure is justified and the sacrifice of important structures or organs should be made if, by so doing, the patient is assured of complete recovery from an imminent danger.

The patient must, of course, be protected from the inherent dangers of the surgical procedure and this is the responsibility of the surgeon who accepts the patient for treatment with thought of subjecting him to an operation which may be so severe as to cost his life. Thus, certain qualities are demanded of the surgeon; they include good judgment, rational treatment, conservatism, simplicity of technic, operative skill or manual dexterity, gentleness, and careful speed.

Perhaps the greatest error in surgery is the undertaking of an unnecessary operation. If such be the case, certainly the second greatest error would be the undertaking of an operation for which the surgeon has not the necessary skill nor background.

Imitative technic is one of the great hazards in the surgical field. As a rule imitative technic is based on hazy knowledge of surgical anatomy, on a poor understanding of surgical pathology coupled with incomplete knowledge of surgical physiology. The imitative surgeon works slovenly, frequently unnecessarily sacrificing tissue, and usually the results are poor anatomically and physiologically. There is a prolonged surgical convalescence; the final results naturally leave much to be desired.

Speed, while desirable in all operations, must not be gained at the cost of thoroughness of the work at hand. Speed may not be based alone on the surgeon's manual dexterity. Frequently the attitude of the operating team is a factor. Much unnecessary time may be lost if the operating team is on edge as the result of the temperament of the surgeon or, for that matter, of any member of the operating room staff.

The surgeon himself finds his temperament varying due to stresses and the vicissitudes of his daily obligations. It might be wise to postpone important surgery if the surgeon, during the past 24 hours, has had little sleep or has undergone mental hazards associated with problems, not necessarily connected with his practice and profession. Personally, I should like my surgeon to be clear of mind and concerned only with the problem at hand.

The risk of surgery is dependent upon these factors and certain others concerned with the physical condition of the patient:

First, the patient's age is important. Individuals in the first decade and those beyond the fifth decade of life can be considered less satisfactory risks than those from the second to the fifth decades. Beyond the seventh decade the surgical risk rapidly increases, although in recent years improved anesthesiology, better understanding of body chemistry, and simplified surgical technics have improved the outlook for this classification.

Second, a clean gastrointestinal tract improves the surgical risk appreciably. This may be judged by the sweet breath and the clean tongue of the patient.

Third, teeth, tonsils, sinuses, and other sources of autointoxication must be evaluated. Unless the surgery is emergent, sufficient time should be spent in ameliorating any source of autointoxication found.

Fourth, laboratory examinations should be made, including blood count, bleeding time, urinalysis, and a Wassermann test as minimum requirements.

Fifth, blood pressure, cardiac rate and regularity, and the presence of vascular disease, such as congestive decompensation, should be thoroughly studied. Modern anesthesiology has reduced the risk to the cardiac patient appreciably but careful review of circulatory efficiency and the state of the vascular tree is still imperative.

Sixth, renal impairment frequently diminishes the chances of recovery. The phenolsulfonphthalein test or the determination of urea concentration and a complete blood chemistry are indicated if any evidence of renal insufficiency exists.

Seventh, the hazard of surgical calamities, none of which can be foreseen, contributes to the general surgical risk. Under the heading of surgical calamities there might be included the earthquake, the unexpected strong wind with loss of glass in the operating room, explosions of oxygen tanks, and falling objects such as the overhead operating room lights. All of these things I have encountered personally. While they can not be controlled specifically, careful study and planning may appreciably reduce their occurrence.

There are also other considerations which alter the surgical risk. One of these is the care of infants and children. Pediatric problems require the service

*Presented at the Teaching Sessions on Surgery, Fifty-Third Annual Convention of the American Osteopathic Association, St. Louis, July 13, 1949.

of a qualified pediatrician in conjunction with the surgeon for best service to the patient. Geriatric practice also requires special consideration. Far more preoperative treatment is necessary in the handling of the geriatric surgical patient than of patients in any other period of life.

Another problem requiring special consideration is that of the chronic alcoholic surgical patient. This individual responds poorly to almost any anesthetic, requires skillful postoperative care, and has many psychological problems all of which must be properly handled if the risk is to be improved.

Needless to say, the preoperative care of tuberculous patients falls within a real specialty. In fact, the need of the tuberculous patient must be great to warrant surgery at all.

Finally, there exist the syphilitic problem and the problem of other constitutional diseases either known by the patient or discovered by the physician at the time of surgery. All of these must be evaluated and treated, either before or with the surgical procedure as is indicated.

The selection of the anesthetic should be undertaken with equal responsibility placed upon the surgeon and the anesthetist. Anesthetic practices differ widely in various parts of the country; in my own locality, basal anesthesia, particularly with Sodium Pentothal, together with cyclopropane, oxygen, and curare is in general use. This combination gives excellent results in the majority of cases. Spinal anesthesia too comes in for its share of use. Local anesthetics and regional blocks are used as indicated and in children ether vapor is without peer. However, the special problems of the patient must be reviewed by the surgeon and the anesthetist and, after consideration of the risk factors, the anesthetic of choice selected.

At this point it might be wise to interject a question: who is to give the anesthetic? It is my opinion that a qualified physician anesthetist is imperative. There are areas within the United States even yet, where the nurse anesthetist bears the responsibility of the anesthetic. I cannot concede this practice to be justified. In view of modern understanding of physiology and body chemistry and with the advent of new anesthetic agents, no nurse is qualified to assume the anesthetic responsibility on a parity with the surgeon. It would be ideal if the anesthetist was qualified by certification by his national board and was kept up to date by frequent postgraduate tours and studies. It should not be assumed that because a man simply gives an anesthetic his share of the responsibility is so small as to entitle him to only poor remuneration. Such a state of affairs has led to a paucity of qualified anesthetists. The economic oppression of anesthetists in general calls few physicians to that field.

Perhaps, at this point, it might be well to evaluate the numerical consideration of good risk, fair risk, and poor risk. The good risk patient is one who is considered to have between 80 and 100 per cent chance of surviving the operative procedure to be undertaken. The fair risk patient has from 40 to 80 per cent and the poor risk patient has less than 40 per cent chance of surviving the surgical ordeal. The risk must be evaluated from the surgical standpoint and so recorded. It must also be evaluated from the anesthetic standpoint and likewise recorded. These risks should be noted on all surgical charts.

Finally, the surgeon should not forget that his patient, as a rule, is unacquainted with hospital procedure. It would be well if in all cases the surgeon or a qualified member of his staff took time to explain to the prospective surgical patient what his reception at the hospital would be with regard to finances and to just what was going to happen during his first 12 hours in the hospital itself. If this were done much pressure would be taken from the admitting staff of the average hospital. It has been my experience that dissatisfactions usually have their inception upon admission to the hospital or shortly thereafter, and are usually due to some totally innocent happening. Indoctrination of the patient concerning normal hospital routine may prevent such occurrences.

It is common practice for the attending surgeon to indicate the preoperative diagnosis upon the hospital medical chart. Any complication or any unusual aspect of the case which will aid the house staff adequately to prepare for and overcome a possible surgical hazard should also be noted. The preoperative care of the patient, once he is admitted to the hospital, should be ordered in writing upon his chart. Such ordering should include the necessary ambulant bed care, the request for surgical preparation of the abdomen or the operative field, the order for enemas or catharsis, or, if such procedures are not desirable, specific orders to refrain from them, the indicated sedation, and an outline of the diet prior to surgery.

Much of value can be gained so far as comfort is concerned if the patient is given gentle osteopathic manipulative treatment, together with his bedtime sedation, by the surgeon, the attending physician, or a member of the house staff who is qualified to do so. Personally, I have found that this manipulative endeavor establishes a physical bond with the patient which contributes greatly to his welfare during his entire stay in the hospital.

Special orders may be necessary in the preoperative care of the patient. These include the type of enema, the type of sedation, the amount and desired type of operative premedication, preoperative catheterization, and laboratory work. Especially important are notations pertaining to specialized needs, such as digitalis, or other drugs, idiosyncrasies to drugs, and general idiosyncrasies of the patient himself.

Precautions should be taken in the transfer of the patient from his room to the surgery. Either cold, drafty corridors should be avoided or the patient should be warmly covered. The fears of the apprehensive patient should be quieted or, if that is impossible, surgery should be postponed until a more receptive frame of mind is achieved.

The interlude in the surgical amphitheater will not be discussed. Postoperative procedures which begin with the closure of the skin wound and the transfer of the patient from the operating room to the recovery room will now be considered.

Precautions taken in the transfer of the patient to surgery must be doubled in the removal of the patient from the operating room table and the transfer back to his own bed. It must be remembered that until the patient has regained consciousness and is able to swallow, the responsibility of the anesthetist continues. The most important problem during this time is the maintenance of an adequate airway. Observation of the blood pressure for evidence of shock and respiratory rate for evidence of failure are the duties of the anesthetist.

During the immediate postoperative period there are certain things that must be carefully avoided. One is the correction of osteopathic lesions while the patient is completely relaxed from the anesthetic. Much harm can accrue from this procedure and little good may be derived from wholesale manipulation at this time. In lifting the patient from the operating room table to the stretcher, extreme caution should be used to protect the cervical, dorsal, and lumbar spine and, of course, to prevent the extremities from assuming any unusual or strained position. Brachial neuritis can result from the flailing motion of an arm dropped from its support during the transfer.

The immediate postoperative care of the patient is under the direction of the surgeon with specific orders as required by the anesthetist to control recovery from the anesthetic agents. Any fluid loss from the body should be supplanted as quickly as is possible unless such loss is minimal. Sedatives should be ordered in amounts sufficient to relieve pain and to assure the patient a comfortable transition from somnolence to awareness of his surroundings.

Wet garments should be immediately removed and dry warm garments substituted. Tight bandages of the abdomen and thorax must be avoided. The anesthetic may interfere with the respiratory effort and aid in the accrual of altered carbon dioxide combining power due to failure of the internal respiratory cycle.

Needless to say, the bed to which the patient is returned should be thoroughly warmed, preferably by hot air from a bedside blower. If hot water bottles are used for this purpose they must be removed before the patient is placed in bed. One of the most unfortunate occurrences is the hot water bottle burn of the anesthetized patient. This responsibility is not that of the nursing staff alone, but also of the surgeon and the anesthetist to whom are relegated the responsibility of guiding the patient through the hazardous postoperative period.

Further safeguards should include a properly functioning resuscitator in close proximity to the recovery room, an adequate supply of essential drugs, dressings, and other equipment and supplies. The presence of this equipment certainly reduces the postsurgical risk.

Discussion of the patient's problem by the surgeon, the attending physician, the nurses, or interns within hearing of the patient must be avoided. Patients, during the return to consciousness, often overhear snatches of conversation which to them assume alarming proportions. If any conversation is held within hearing of the patient it should be calculated to be soothing, morale building, and short. All other conversation must be carried on well away from the patient's room.

The orders for postoperative care are written by the surgeon. These orders include all necessary care of the patient during the recovery period. The type and quantity of sedation should be the first order. The type of bed care the patient will need is the second order. The amount of fluids to be replaced intravenously is the third order. The ability of the patient to take water by mouth or the denial of that privilege is the fourth order. Next is the order to catheterize or to avoid catheterization and, finally, that indicating the care of the dressing. At the present time it is common practice to avoid changing the dressings until time for the removal of the skin closure unless there is drainage or specific reason to inspect the wound.

The surgeon before leaving the hospital should check the patient for evidence of shock or hemorrhage and to note the general state of his reaction to the anesthetic and the surgery. If the patient's condition is satisfactory the obligation of the surgeon, for the moment, is fulfilled.

On the first postoperative day the abdomen should be scrutinized for evidence of distention indicating ileus. Should there be any evidence of distention careful auscultation of the abdomen may reveal the tinkling peristalsis indicative of failure of the transportive mechanism of the gut. Immediate and careful care of the problem must be instituted. The bandages should again be inspected to determine if they are too tight and if found to be so they should be immediately loosened. Orders are written on this day for any special drugs required, and for the care of the drain tubes, should any be in place. Laxatives and enemas also are ordered if indicated at this period. If the dressings are to be changed the dressing nurse or the properly delegated member of the surgical team is instructed as to the procedure.

During the early postoperative period the patient should be made as comfortable as possible. Early ambulation greatly decreases the backache so frequently complained of in years gone by. Carefully administered osteopathic manipulative therapy greatly improves body mechanics and speeds the patient's convalescence. Exercise of the thoracic cage by manipulation is particularly beneficial in lung ventilation which in turn improves the internal respiratory cycle and aids in elimination of intestinal gas.

The combination of early ambulation with osteopathic manipulation reduces to a minimum the possibility of embolus, greatly lessens probability of phlebitis, and decreases the necessity for sedation. However, care must be taken with the ambulatory procedure to avoid strain of the calf muscles of the patient as he changes position from sitting to standing. A flat support for the feet and a steady shoulder upon which the patient may lean are worthwhile safeguards.

The feeding of the postoperative patient is controversial. However, it is my opinion that careful early feeding does much to lessen gas formation and definitely improves the patient's general outlook.

The art of the practice of surgery is demonstrated most conclusively during the postoperative stay of the patient. One of the most eagerly awaited events of the day is the visit of the attending physician. The calm assurance that all is going well improves the patient's outlook greatly. Care in answering each question the patient asks relieves anxiety. An outline of the convalescence aids the patient in planning for this period. Thus, when the patient is eventually discharged from the hospital he leaves with the feeling of having been well cared for and with an appreciation of the mechanics of institutional care.

Home care should be continued as carefully as though the patient were still institutionalized. While daily visits may not be necessary, contact by phone or through some member of the family keeps the physician aware of any change in the patient's condition. A valuable policy is to establish a question and answer period at the first office call the patient makes following surgery. A complete and free discussion of the

operative procedure and the resulting altered anatomical condition, followed by a discussion of the physiological changes which the patient may expect, will do much to relieve and reassure the patient that all will be well. On the other hand, the patient should be informed of any condition which could not be corrected.

If the procedures outlined in this paper are carried out as carefully and as skillfully as possible, the patient will be restored to a state of health with a minimum loss of time from his daily occupation and a maximum amount of comfort and safety.

SUMMARY

A review of surgical principles has been presented which emphasized the following:

1. The attributes of the surgeon and the aim of surgery
2. The importance of careful preoperative care in reducing surgical risks
3. The importance of selecting proper anesthetic agents and the role of the anesthetist
4. Writing of preoperative and postoperative orders
5. Postoperative care and its importance in avoiding complications
6. Value of osteopathic manipulative therapy
7. The art of personal relations with the patient
8. Directing home care of the patient.

If these points are remembered and put into practice, patients will have less difficulty while in the hospital and will be left with a feeling of appreciation for the hospital and its staff.

805 N. Central Ave.

REFERENCES

1. Thorek, M.: Surgical errors and safeguards. Ed. 4. J. B. Lippincott Co., Philadelphia, 1943.
2. Bickham, W. S.: Cited by Thorek, M., *op. cit.*, ref. 1, p. 4.

Pitfalls and Errors in Roentgen Gastrointestinal Examination*

DWIGHT A. STILES, D.O.

Phoenix, Ariz.

Roentgenological examination of the gastrointestinal tract abounds with traps for the unwary and inexperienced observer. The effectiveness of x-ray examination of this tract, probably more than any other system in the body, depends on the expert use of the fluoroscope. The fact that skill in its use can only be gained by long and continuous practice is neither known or believed by many doctors. Hodges[1] states that inspection of the various parts of the body through the medium of a glowing screen appears so spectacular and so simple that, in many instances, the service of a competent radiologist is felt unnecessary. The truth is that the casual and unskilled use of the fluoroscope leads only to grossly erroneous observation for only experience can teach one to think in terms of fluoroscopic images.

The trained fluoroscopist "sets the stage" for his examination by following well-established rules of procedure. The patient must be seen at a specified time which allows for proper preparation, such as fasting, including abstinence from all oral medication if possible, during the examination, catharsis, enemas, et cetera. An improperly prepared gastrointestinal tract may lead to serious errors of interpretation. A minimum of 20 minutes of accommodation of the eyes to darkness is necessary in order that the examiner may enjoy maximum visual acuity. Here, as in all fields of medicine, every effort must be made to place the patient at ease, for every phase of the examination is aided and abetted by complete relaxation of the patient. This will be readily attested to by any experienced fluoroscopist who has "fought the stomach or the colon" of a worried, anxious subject who refuses to relax.

It would seem that the majority of errors in roentgen gastroenterological diagnosis are those of omission rather than of commission. For example the taking of a preliminary abdominal scout film, especially in the acute abdomen, should be a "must." Failure to take it may result in administration of barium to a patient who has a partial or early obstruction of the bowel with resultant complete obstruction. The preliminary film may reveal a multitude of significant findings which may act as immediate signposts to effective diagnosis. Many of these may be obscured if barium has been given prior to this initial survey.

Initial screening of the chest may immediately point the finger of suspicion at a substernal thyroid, atelectasis with associated tracheal deviation, pneumonia, aneurysm, pleural effusion, tuberculosis, elevated diaphragm, sub-phrenic collection of gas, or a host of other conditions calling for further study of the chest as well as offering a possible explanation for the presenting gastrointestinal complaint.

THE GALLBLADDER

Since the biliary tract is such an integral part of a complete gastrointestinal survey it has been my routine whenever possible to initiate this portion of the examination at the outset, for a barium-filled stomach or bowel may partially or completely obscure the gallbladder and render the examination unsatisfactory. Good detail is imperative in gallbladder examination lest small, "negative" or cholesterol-type stones be obscured against the chalky white background of the opaque, iodine-filled gallbladder. If the presence of biliary calculi is suspected, but not verified, at the initial filming, it is well to film the gallbladder in the upright position in an attempt to float any small stones which may have been lying unseen in the body or neck of that viscus. The preliminary abdominal survey film may occasionally reveal a small positive or calcium-type stone, the density of which so nearly approximates that of the opaque dyes in the gallbladder that it would pass unseen.

The gallbladder which remains obscured by hepatic flexure gas despite the administration of Pitressin, hot water by mouth, and the other oft tried measures, can frequently be seen well by having the patient filmed in the right lateral decubitus position or lying on the right side with a pillow under the right lumbar area. These positions usually place the gallbladder so that it is lateral and superior to the offending hepatic flexure of the colon.

*Presented at the Radiology Teaching Sessions, Fifty-Third Annual Convention of the American Osteopathic Association, St. Louis, July 13, 1949.

In order to minimize errors of interpretation in the analysis of gallbladder films it is well to review a few pertinent facts. Although clear visibility of the gallbladder together with some degree of emptying response to a fatty meal in general indicates normal function of that organ and faint or nonvisualization is a reliable index of impaired function, such findings can not be interpreted directly in terms of inflammatory disease of that viscus. Approximately 16 per cent of patients with *normal cholecystograms* who ultimately have cholycystectomy show frank evidence of gallbladder disease on microscopic examination of the tissue, showing that inflammatory disease *may* exist without abolishing the ability of the gallbladder to concentrate. About 80 per cent of patients with gallbladders *not visualized* by the oral dye (Priodax) method show major inflammatory disease on pathological study. Feldman[2] states that, according to Graham and his coworkers, *nonvisualization by the intravenous method* indicates an abnormal gallbladder in 99 per cent of cases, with 90 per cent of these cases showing gallstones as the causative factor.

On the basis of these facts I have for some time used intravenous Iodekon in 500 cc. of warm saline administered slowly over a period of 1 hour the night before examination. This method is employed on all hospital cases with the exception of occasional ones with known allergic backgrounds, those with severe coronary disease and severe hypertension, or patients who are extremely nervous. It has been my experience that in perhaps 5 to 10 per cent of the cases in which there was unsatisfactory visualization of the gallbladder by the oral route, diagnostic concentration of dye has been obtained with the use of the intravenous route described above. The method is especially effective in cases of vomiting.

Since the functional response of a normal gallbladder to a fatty meal may apparently vary considerably on different occasions it is felt that probably the chief value of the fatty meal is in producing a more accurate evaluation of calculi and small mucosal polyps in the gallbladder and in permitting an improved visualization of an extremely faintly concentrating viscus.

THE ESOPHAGUS AND PHARYNX

In the examination of the esophagus the rapidity of the act of swallowing makes close observation of this portion of the tract imperative. The use of contrast material of greater viscosity such as thick barium sulfate or Rugar is often necessary, as well as examination and filming in the prone or oblique position, in order to obtain films of good quality in this region. If the patient holds his breath in deep inspiration the hiatus at the diaphragm is narrowed and better esophageal filling is thus obtained. One must remember that the walls of the esophagus are soft and pliable and are normally indented by the transverse aorta and the left bronchus. The lower end deviates anteriorly to the left at the diaphragm.

An often neglected phase of gastrointestinal examination is observation of the pharynx during the swallowing of an opaque medium. Arendt and Wolf[3] have called attention to a phenomenon which they refer to as the vallecular sign which consists of retention of the barium mixture in the pockets of the valleculae and pyriform sinuses of the pharynx during the swallowing act.

In a normal patient the barium enters the valleculae and is immediately spilled along the lateral walls of the pharynx into the pyriform sinuses. Both of these recesses empty rapidly, in a normal subject, into the open pharyngeal space. Failure of one of these recesses to fill usually means neoplasm in the recess, while abnormal retention of barium in these recesses or a true vallecular sign, is often found in esophageal malignancy, carcinoma of the cardia of the stomach or the hypopharynx, or in pathology of the mediastinal or paramediastinal structures—all a considerable distance from the pharynx. The vallecular sign is further observed in myasthenia gravis, bulbar paralysis, and multiple sclerosis where, as expected, the swallowing act is affected. It is interesting to note that this sign is *not* seen in neurotics complaining of dysphagia and is thus of great help in differentiating the inorganic from the organic case of dysphagia.

To summarize it may be said that the presence of a positive vallecular sign is indication for an especially meticulous examination for neoplasm or mediastinal pathology.

At the lowermost end of the esophagus a rather frequent phenomenon is that of cardiospasm, due to a derangement of the neuromuscular mechanism controlling the muscle coats of the esophagus. The resulting dilatation from pharynx to esophagus may produce enormous dilatation of the esophageal and mediastinal shadows and prove quite confusing unless roentgen studies with barium are carried out. The use of inhaled amyl nitrite or administration of atropine will often relax the cardioesophageal spasm and aid in differentiating the benign cardiospasm and organic constricting lesions at the lower end of the esophagus.

It is well to remind ourselves of one paramount fact, in the consideration of *all* neoplasms of the gastrointestinal tract, when one is attempting to establish a diagnosis by means of the roentgen ray: Any tumor in this tract is invariably associated with a defect in the lumen of the tract which has been filled with barium, *if* and *only if* the tumor encroaches upon that lumen and can produce a visible deformity. If the tumor arises in the walls of the tract and extends outward or away from the lumen it may progress and invade or involve surrounding organs without producing any visible luminal deformity at the point of its origin. It is, therefore, not difficult to understand that the true volume of the tumor may greatly exceed the size of the filling defect and that in such cases, the tumor may be overlooked until too late.

Here again the importance of careful fluoroscopy is emphasized, for infiltration of the wall of a viscus by neoplasm may produce altered physiology in that viscus, such as fixation of its wall, a break in the peristaltic wave, a deep incisura due to spasm or other pathologic phenomenon, *before* any filling defect of the lumen can be seen, and aid materially in early diagnosis of the lesion.

In the esophagus most malignant lesions show extensive encroachment on the lumen at examination because the patient does not usually seek relief for dysphagia until the lesion is well advanced.

As in malignancy elsewhere in the tract it is well to remember that while neoplasm usually produces a rather abrupt transition from normal to abnormal configuration and tends to be short in length, producing a mottled type of defect with overhanging edges, the inflammatory lesion tends to be characterized by gradual transition from the normal to abnormal pattern, usually involves longer segments of the tract, and lacks the mottled, overhanging appearance of malignancy.

Diaphragmatic hernias commonly found at the esophageal hiatus close to the ensiform cartilage may produce substernal distress closely simulating coronary disease. One must not confuse a large phrenic ampulla at the lowermost esophagus for a true herniation, for in some individuals this ampulla is well marked and undergoes great variation in size during the swallowing act. An unexplained wide mediastinal shadow, a cardiac shadow of double density on a chest film, or suggestive gas shadows in the lower thorax always call for investigation of the entire gastrointestinal tract, for even the intestine may be involved in the herniation. Cases of suspected diaphragmatic herniation should be examined in the Trendelenberg position as well as the standing position with the patient bearing down while holding the breath in deep inspiration.

THE STOMACH

The more stomachs the roentgenologist examines the more he is impressed by the fact that no well defined description of a so-called normal stomach is available. Multiple variations are present, in the same stomach, in size, shape, and position in various stages of life as well as at different hours of the day because of many extrinsic factors affecting this organ.

The term "dropped stomach" appears to be the receptacle into which many undiagnosed gastrointestinal problems are thrown. There is no proved scientific relationship between the position of the so-called ptotic stomach and the existence of gastrointestinal complaints assigned to it. The stomach is a muscular organ and if its tone is good it empties itself the same as any other hollow muscular portion of the tract of which it is a part. In this regard one cannot help but be impressed by the functional integrity of the stomach and bowel in the majority of cases of artificial pneumoperitoneum (e.g., in collapse therapy in tuberculosis) where instillation of large amounts of air into the peritoneal cavity markedly displaces these viscera from their so-called normal positions. Many patients even report improved function of the entire tract, such as better elimination, after pneumoperitoneum.

There are many methods of examining a stomach. Proficiency is gained by establishing some routine whereby every square centimeter of the gastric mucosa is scrutinized under the screen with the minimal possibility of overlooking an early gastric or duodenal lesion. This routine must be flexible enough to permit special attention to any suspicious areas or regions not accessible to palpation and manipulation such as the cardia. This is particularly true during the subsequent filming or permanent recording of the viscus.

When one remembers that of all the malignant neoplasms in the human body those in the alimentary tract are responsible for the largest annual death toll and that more of them arise in the stomach than in any other part of that tract, it is not surprising that there are many advocates of mass stomach surveys such as are being carried out in tuberculosis. This only adds further to the impetus for more thorough gastric examination. If there is the slightest doubt regarding the significance of a certain area in the stomach reexamination should be insisted upon. I frequently call upon the gastroscopist to aid in the appraisal of a questionable area. His help is often of inestimable value.

It is well to bear in mind that while it is usually child's play to diagnose the filling defect of an advanced gastric lesion, it is often extremely difficult to establish the early one. Areas of subdued peristalsis or ominous quiet due to tissue stiffening must be sought. With small amounts of barium in the stomach the opaque medium is worked into all regions of the gastric mucosa while alterations in the mucosa, the curvatures, the cardia, and the antrum are meticulously sought.

In an analysis of the upper third of the stomach, the fundus proper, the cardia, and the portion immediately below it as well as the abdominal portion of the esophagus are considered. Since this portion of the stomach lies deep in the left hypochondrium and is inaccessible to palpation it is difficult to examine. When the examination is done in the upright position the opaque medium passes through rapidly without stopping and in the Trendelenberg position abundant barium may obscure the lesion. The air bubble in the cardia, however, aids in the examination, for a tumor often projects into it as a soft tissue shadow which alters the bubble's outline. If the bubble is absent or small it may be made larger by ingestion of a carbonated beverage. Needless to say such a study should always be followed by examination with an opaque medium to confirm the diagnosis. The fluoroscopist must carefully observe any unusual deviation of the barium stream from its course which normally follows the lesser curvature its entire length along the magenstrasse. Tumors in the upper third may divide the flow of barium into small streams upon its entrance, deform the dome of the diaphragm, and increase the distance that separates the air bubble from the lung superiorly.

One must be careful in evaluating soft tissue shadows in the cardia air bubble since liver, spleen, and heart may superimpose their shadows respectively on the inner, outer, and superior one-thirds of this bubble and cause confusion. These viscera, however, do not produce the typical filling defects of a malignancy. The jutting of the esophageal mucosa at the top of the cardia may produce a stellate pattern simulating tumor, which must be carefully evaluated. Almost sole reliance must be placed on roentgenological examination for, with the exception of the area high on the greater curvature, the areas in this region are relative blind spots to the gastroscopist.

PEPTIC ULCER

Since peptic ulcer has always been one of the most colorful and dramatic lesions of the gastrointestinal tract a common misconception has developed that it is always easy to diagnose, presents clearly defined symptoms and laboratory findings, and in general shouts its presence. Many times this is definitely not the case. Since we are all familiar with the classical radiograph of a large peptic ulcer it might be well to point out certain not-so-classical screen and film observations. Persistent muscle spasm in the prepyloric segment of the stomach often accompanies a peptic ulcer anywhere along the lesser curvature of the stomach. A persistent incisura or indentation along the greater curvature of the stomach opposite the crater is often present. Its absence by no means rules out ulcer. A fixation or stereotyping of the gastric wall as observed on multiple exposures of the stomach is often observed in gastric ulcer, benign or malignant. It must be emphasized that if the crater is small or completely filled with food, mucus, or blood that prevents the entrance of opaque material the crater may not be visualized. At times the only identification of a crater will be at screen examination, following a single swallow of barium, before larger amounts have obscured the lesion.

Let us not make the mistake of believing that all large ulcers are malignant and all small ones are benign

for exceptions are found both ways. It is better to consider that any ulcer that fails to steadily regress under adequate conservative care must be considered malignant.

It should be strongly emphasized that many gastric ulcers do not project from the margin of the lesser curvature where they can be easily seen for they involve the posterior wall aspect of this curvature frequently and are thus not seen in the frontal or common posteroanterior projection. Here the individualizing of filming comes into play, for oblique or lateral positioning may frequently be necessary to demonstrate the pathology.

Oppenheimer[4] has called attention to the use of the supine position in diagnosing lesions of the body and posterior wall of the stomach that are suspected but not seen on routine examination. With the patient placed on his back, following upright screening, the barium flows up into the fundus of the stomach and the gas descends into the body and antrum. This provides a double contrast effect of gas and opaque in the latter two areas and has proved very useful in revealing posterior wall ulcers of the corpus, gastric polypi, and small malignancies of the posterior wall of the fundus. By this method I have been able to identify several posterior wall ulcers not seen in the usual prone position.

The term "gastritis" has been loosely applied in analysis of films of the stomach. It is well to remember that "all that is rugal is not gastritis." In true gastritis the rugae are wider, higher, and more rigid than normal folds. They do not disappear with pressure as do normal folds on screen examination. There is increased gastric secretion as noted in the fluid level of the stomach and often small round areas of lessened density due to particles of mucus. Determination of the type of gastritis rests chiefly with the gastroscopist on whom we have learned to rely in accurate evaluation of this entity.

In duodenal ulcer the x-ray diagnosis can be made with positive certainty only if the crater can be demonstrated. With compression of the cap and perseverance in fluoroscopy it can usually be shown if present. Its presence is strongly suggested when there is a splitting of the stream of the opaque medium as it passes through the cap giving a so-called rose-petal effect in the bulb. Persistent marginal deformities of the cap, especially in the first inch or inch and a quarter of the cap are quite suggestive of ulcer. The crater is usually found at the point of convergence of these incisura or indentations. However, the absence of these marginal changes does not rule out ulcer for we have all seen the large crater of the veiled type, revealed only by marked compression, in an innocent appearing, smoothly margined cap. As in gastric ulcer the importance of spot films with compression, two-dimensional projections, and serial films must be emphasized in appraising the duodenum. The scarred cap from an old, healed duodenal ulcer may simulate the deformity associated with active bulb ulcer but in the latter one finds evidence of duodenitis with a hyperirritable duodenum, a sensitive cap, the presence of an actual crater, and clinical symptoms compatible with an active ulcer.

It is well to bear in mind that by no means all ulcers give the classical signs and symptoms expected. One can expect to encounter patients who deny all pain and complain only of "gas" in the epigastrium or vague distress tending to recur about ½ to 1 hour after meals but presenting roentgen evidence of peptic ulcer. Headache, precipitated by an empty stomach, occasionally will be the only complaint. The bleeding ulcer may be the silent ulcer and must be diligently sought for. Oddly enough this type usually does not perforate. In any case of unexplained gastrointestinal hemorrhage the postbulbar region or duodenal loop must be closely examined for ulcer, for incidence of hemorrhage is high in this location.

Space does not permit a lengthy discussion of postsurgical radiography of the stomach and small intestine. Suffice it to say that whenever possible the exact type of surgery which has been performed should be definitely known, for without this information x-ray examination may be most difficult. Jejunal ulcer recurrence is common in gastroenterostomy at the stoma or just below it unless a complete or generous partial gastrectomy has been done. If the nonacid producing mucosa which lines the lower third or half of the stomach has been removed, the acid secreting cells of the fundus no longer receive the stimulus necessary for their function and hyperacidity is, therefore, minimized.

Much has been written for and against vagotomy in the treatment of peptic ulcer but, as with other methods, only time will evaluate its true worth. Postoperatively on roentgen examination[5] one usually finds a markedly distended stomach with retention of the opaque barium for as long as 24 hours following ingestion. The duodenal cap may be very difficult to fill and appear deformed. A crater may be present with complete absence of pain or local tenderness. The cap deformity may persist indefinitely though gastric emptying often gradually improves. Considering the fact that vagotomy with or without concomitant gastrectomy or gastroenterostomy often relieves the patient of his ulcer symptoms it is not illogical to assume that osteopathic manipulative therapy with its balancing effect upon the sympathetic and parasympathetic nervous systems can play a major role in facilitating peptic ulcer healing.

THE SMALL INTESTINE

Until recent years perhaps one of the most neglected yet most fascinating fields in all gastroenterology has been the small intestine. Fortunately the work of Golden,[6] Cole, [7] Hodges,[8,9] and other investigators has done much to enlighten us, but in far too many cases of small bowel lesions there are annoying, persistent, and incapacitating symptoms caused by these lesions which routine examinations fail to uncover, and opportunities for the proper therapy are lost or delayed. All too often the small bowel from the ligament of Treitz to the cecal area is scanned but not meticulously examined in passing from stomach to colon. It must be emphasized that a thorough knowledge of the nervous and muscular mechanisms of small bowel behavior must be possessed by the examiner in order to interpret the abnormal.

In order to supply at least a starting basis for examination of the small intestine I would like to suggest one method of narrowing the field down to those cases which seem to call for more exhaustive examination. Following barium feeding the stomach and upper bowel well down into the jejunum are screened. Full abdominal films are subsequently made at 1, 2½, and 5 hours following the ingestion of the barium. An even more rapid procedure may be followed by suspending the barium in saline. With the first of these two methods all the barium will usually be found below the umbilicus and to the right of the midline after 5

hours, but there are normal exceptions. Organic lesions or functional disturbances which disrupt this timetable are thus brought to light. Cases presenting any of the following may represent small bowel dysfunction, according to Hodges:[8]

1. Gross abnormalities of bowel habit
2. Chronic diarrhea or acute refractory constipation not due to demonstrable disease of the colon
3. Colicky abdominal pain unrelated to bowel movements
4. Gaseous distention
5. Severe anorexia with or without nausea or vomiting
6. Unexplained hemorrhage from the tract or chronic anemia of unexplained nature.

If structural abnormality or functional misbehavior is discovered through roentgen examination of the small bowel a number of causes must then be considered. Neoplasms of the small bowel, which are rather rare, are usually found only when the lumen is deformed, often to the point of obstruction. The deformity is usually fixed, is associated with displacement of the gut segments, and produces considerable small bowel dilatation proximal to the site of the lesion.

Inflammatory lesions such as chronic regional enteritis and ulcerative colitis may produce obstructive lesions simulating malignancy, except that they do not generally possess the clean-cut, overhanging edges of neoplasm. Under proper therapy they usually show roentgen improvement, unlike neoplasms. Cases of chronic nonobstructive ileojejunitis cause delayed transit, variability of lumen-width and widespread mucosal variations in the small bowel.

Other causes of this type of nonmalignant dysfunction of the small bowel are edema of the bowel secondary to partial obstruction, low serum protein level, severe anemia, hookworm disease, Henoch's purpura, and occasionally allergic conditions with urticaria. Nutritional deficiencies (avitaminosis B and sprue), primary or secondary, may be a further cause of a disorder of small bowel function. Often clinical laboratory or pathologic study must be resorted to in order to establish the exact cause of disturbed function. Last, but not least, are cases of small bowel dysfunction, demonstrable by roentgen examination, which have been proved due to myelin degenerative changes in the spinal cord associated with swelling of the ganglia of Auerbach's plexus and changes in the intramural nervous system of this bowel of unknown cause.[8]

Is it not logical to assume that the last type of case, associated with no vitamin deficiency, anemia, specific neurological disease, or neoplasm, and yet accompanied by profound changes in motor and absorptive functions of the intestinal tract, may be on the basis of osteopathic lesion pathology? This is especially true when neuropathies due to diabetes, pernicious anemia, tabes dorsalis, and metallic poisoning have been excluded as the underlying cause of the disordered small bowel function.[9]

THE COLON

In the consideration of diseases of the colon a sound basis for discussion is one question: What are the general characteristics of a normal or undiseased colon? In this type of large bowel one can expect to find a rectal ampulla and cecum with a rather large capacity, a redundancy at the hepatic and sigmoid flexures, a rather sharp angulation at the splenic flexure, and well-defined haustrations with scalloping of the transverse portion with diminished or entirely absent haustrations in the descending colon. One should routinely employ postevacuation films, for this permits an evaluation of the pliability of this portion of the gut as well as an opportunity to study the mucosal folds. Meticulous fluoroscopy is imperative in all colonic studies lest minimal lesions be overlooked. The patient must be rolled from side to side during the examination, as the opaque medium is slowly administered, in order to study the bowel in profile, especially in the region of the flexures, where an early lesion is easily obscured. Whenever a more thorough investigation of the mucosa is felt necessary air should be injected under screen control followed by stereoscopic films of the abdomen. Polyps with pedicles may be beautifully demonstrated with this technic as well as diverticuli, malignancies, and the edematous mucosa of an ulcerative colitis.

With regard to colitis it is well to remind ourselves that this term is one of the most loosely used and grossly abused in all gastroenterology. "Colitis" is not a symptom complex characterized solely by evidence of colonic dysfunction but rather a disease entity of the colon in which there is histological evidence of an inflammatory process involving the large bowel. We must learn to apply the term specifically to those cases showing characteristic roentgen evidence of this inflammatory process, for the prognosis is much more grave than it is in cases of dysfunction of the colon without positive roentgen findings. What, therefore, should we look for in true ulcerative colitis? The most common form is the thromboulcerative type of unknown cause that so often attacks the young adult. This type almost always begins in the rectal ampulla and spreads progressively toward the ileocecal region usually stopping before the right colon is markedly involved. During the acute, florid stage there is x-ray evidence of deep, ragged ulcers producing a jagged, serrated, inflammatory, and undermined appearance of the colonic mucosa. An enema filling the bowel often causes great pain and is extremely difficult to retain. The opaque medium is rapidly expelled from one hyperirritable segment to another as though no one part of the colon wants to keep it. In the chronic stage, provided the patient has survived, progressive scarring reduces the caliber of the colon, erases the haustral markings of the transverse colon, and shortens the entire colon. Extremely fine serrations along the margins of the bowel are due to the irregular, ulcerating, inner surface. In contrast to the idiopathic or thromboulcerative type of ulcerative colitis we must learn what to look for in the specific types where the cause is known. Amebic colitis and tuberculous colitis tend to involve the right side of the colon, while the thromboulcerative type, as has been noted, begins in the rectum and progresses in a retrograde manner.

The diagnosis of amebic colitis rests upon the demonstration of the causative organism in the bowel but certain roentgen findings are highly suggestive. A very early sign is segmental involvement of the colon, with intermediate normal zones, as manifested by extreme spasticity and irritability of the involved segment in contrast to the normal bowel. The cecum is a favored site of involvement and it may present fine saw-tooth, feathery, or thorny projections due to superficial ulcerations with associated cecal deformity. Excessive granulation tissue about the shallow undermined ulcers may form circumscribed tumors on palpation of the abdomen and scarring may result in intestinal

obstruction. Elevation of the right diaphragm and hepatic enlargement should be looked for in all cases suggestive of associated amebic abscess of the liver.

The diagnosis of tuberculous colitis must be ruled out in all cases presenting diarrhea, intermittant low-grade fever, and a palpable tumor with slight tenderness in the right lower abdominal quadrant, especially in young adults. Tuberculous colitis occurs in an extremely high percentage of all cases of advanced pulmonary tuberculosis. From the roentgen standpoint the site of predilection is the ileocecal region where it is found in 90 per cent of cases. The most important single roentgen sign of this disease is marked intolerance of the cecum to an ingested barium meal. Failure of the meal to remain in the cecum and ascending colon, while the ileum and transverse colon are filled is Stierlin's sign and highly suggestive of tuberculous colitis. The cecum becomes very deformed, ragged, shriveled, and funnel-shaped and the lower 2 to 3 feet of ileum are involved, with patency of the ileocecal valve and stenosis and rigidity of the terminal ileum. In amebic disease, by contrast, the terminal ileum is rarely involved.

Diverticulosis of the colon is recognized as a frequent finding in roentgen examination and its diagnosis is simple. When inflammation develops due to strangulation of diverticuli diverticulitis naturally results and the diverticuli themselves may be difficult to see. The presence of a defect in the lumen of the bowel, the length of the involved segment, and its gradually tapering extremities are all helpful in making the diagnosis of diverticulitis, which is important, for perforation with pericolic abscess, peritonitis, and death may result.

Much has been written on roentgen diagnosis of neoplasms of the colon. Cancer of the colon and rectum[10] can be controlled or eradicated only if discovered early. Since only about 50 per cent of those with operable carcinoma of the colon are alive and free from malignancy in 5 years, it is important that the diagnosis be made before lymph node spread has occurred. Since 65 to 75 per cent of all cancers of the colon can be seen with a sigmoidoscope and biopsy material secured, it becomes our responsibility to see that this method is employed. Its use should be followed by a painstaking screen and film examination of the colon in all positions with the colon completely filled, for there may be multiple areas of neoplastic involvement showing characteristic mottled filling defects. In demonstration of polyps by the double contrast method it is well to inject the enema until the midpoint of the transverse colon is reached and then stop. The enema is expelled and the bowel is then moderately distended with air. Stereoscopic films can then be made in various positions. It should be remembered that isolated or diffuse polyps of the colon are considered potentially malignant by all authorities and that early demonstration is imperative if patients having them are to be saved.

CONCLUSIONS

1. We must know the normal to interpret the abnormal. The more we know of the abnormal the fewer errors we are going to make in the field of roentgen gastrointestinal diagnosis.

2. The importance of proper preparation of the patient, both anatomically and physiologically, for gastrointestinal roentgen examination has been touched upon.

3. A few of the more important disease entities involving the tract have been discussed. In this paper no attempt has been made at complete discussion of any phase.

4. The need for painstaking examination by fluoroscopy and two-dimensional projections in x-ray filming has been emphasized.

5. The role of the osteopathic lesion as a probable etiological agent in functional disturbances and certain organic lesions of the gut has been mentioned.

Copper State Clinic
5309 N. Seventh St.

REFERENCES

1. Hodges, F. J.: Gastro-intestinal tract; a handbook of roentgen diagnosis. Year Book Publishers, Chicago, 1944.
2. Feldman, M.: Clinical roentgenology of the digestive tract. Ed. 2. Williams & Wilkins Co., Baltimore, 1945.
3. Arendt, J., and Wolf, A.: The vallecular sign; its diagnosis and clinical significance. Am. J. Roentgenol. 57:435-445, April 1947.
4. Oppenheimer, A.: Supine projection in diagnosis of lesions of corpus and posterior wall of stomach. Am. J. Roentgenol. 55:454-463, April 1946.
5. Furey, W. W.: X-ray observations before and after vagotomy. Radiology 51:806-815, Dec. 1948.
6. Golden, R.: Radiologic examination of the small intestine. J. B. Lippincott Co., Philadelphia, 1945.
7. Cole, L. G., and Morse, R. W.: Anatomy of the normal small intestine as observed roentgenographically. Radiology 8:149-153, Feb. 1927.
8. Hodges, F. J., Rundles, R. W., and Hanelin, J.: Roentgenological study of the small intestine; neoplastic and inflammatory diseases. Radiology 49:587-602, Nov. 1947.
9. Hodges, F. J., Rundles, R. W., and Hanelin, J.: Roentgenological study of the small intestine; dysfunction associated with neurologic diseases. Radiology 49:659-673, Dec. 1947.
10. Bell, J. C., and Douglas, J. B.: Roentgen-ray diagnosis of malignant and potentially malignant lesions of the colon and rectum. Radiology 51:297-304, Sept. 1948.

SPOT ORTHOROENTGENOGRAPHY

A method for measuring the length of bones of the lower extremity is presented in *The Journal of Bone and Joint Surgery*, April, 1950, by Louis A. Goldstein, M.D., and Frank Dreisinger, R.T.

A 14 x 36-inch cassette and a brass cylinder 26 inches long and 4½ inches in diameter are needed in addition to the usual modern diagnostic roentgenographic equipment. A cone base with 4 right-angle brackets supports the cylinder. A vertical marker painted on opposite sides of the cylinder helps to center the x-ray tube. The patient is placed in the supine position on the cassette on the x-ray table. Each joint is flexed and marked with a wax pencil on the lateral aspect. The patient is immobilized with a pad between the medial malleoli, a length of gauze bandage binding the legs together just above the malleoli, a cylinder of wood under the knees supporting them firmly equidistant from the film, and a compression band over the thighs. The marks on cylinder and joint are alined and 6 exposures taken rapidly. On the same film pictures are taken of the left wrist and hand for bone-age determination.

Target-film distance is set at 40 inches. For the ankle, 10 milliampere seconds are used at a kilovolt peak of 45; for the knee, 10 at 52; for the hip, 20 at 60; and for the hand 5 at 40.

Errors arise from carelessness in positioning. Only extremes of temperature and humidity alter the film measurably, which can be corrected with a calibrated marker.

The advantages of the method are the economy with which the equipment can be constructed, its applicability for spot films of all parts of the body, the comparative accuracy and convenience of the 40-inch target-film distance, and the lack of distortion.

THE JOURNAL OF THE
AMERICAN OSTEOPATHIC ASSOCIATION

Published monthly by the American Osteopathic Association

Publication Office, 100 S. Kenilworth Ave., Oak Park, Ill.
Editorial Office, 212 E. Ohio St., Chicago 11, Ill.
Address all communications to the Chicago Office

KATHERINE BECKER, A.B.....Acting Editor
R. C. McCAUGHAN, D.O.....Executive Secretary
CLAYTON N. CLARK, D.O.....Business Manager
ROSE MARY MOSER.....Treasurer

EXECUTIVE COMMITTEE

PRESIDENT.....H. DALE PEARSON, D.O., Erie, Pa.
PRESIDENT-ELECT.....VINCENT P. CARROLL, D.O., Laguna Beach, Calif.
PAST PRESIDENT.....STEPHEN M. PUGH, D.O., Everett, Wash.
FIRST VICE PRESIDENT.....FOREST J. GRUNIGEN, D.O., Los Angeles
CHAIRMAN PROFESSIONAL AFFAIRS.....ALLAN A. EGGLESTON, D.O., Montreal, Canada
CHAIRMAN PUBLIC AFFAIRS.....JOHN W. MULFORD, D.O., Cincinnati

Subscription . . . . . Ten dollars a year in advance

Vol. 49 July, 1950 No. 11

DUCHENNE OF BOULOGNE

Recently there was published a book of unusual interest to osteopathic physicians. It is an English translation by Emanuel B. Kaplan of "Physiology of Motion," originally published by Guillaume Benjamin Amand Duchenne,[1] Duchenne of Boulogne, in 1867. This book's claim to the interest of osteopathic physicians is based, first, on the fact that it stands alone as a source of information concerning kinesiology and, second, on the many striking parallels which may be drawn between its writer and Andrew Taylor Still, who lived and worked in the same era.

Duchenne was born in Boulogne in 1806 and received his early education in a religious school, a circumstance which influenced his observations and writings all his life. As Kaplan expresses it, "Perhaps the most interesting and important single factor is Duchenne's teleologic interpretation of every action. He sees a divine purpose in the minutest functional interpretation of every muscle. . . ." Such views, while out of place according to present-day concepts of scientific writing, were, in the works of Duchenne and in the works of Still, a result of early religious training and a reflection of the times in which they were written.

After graduating from the Paris Medical School in 1831 Duchenne practiced in Boulogne until 1842 when he returned to Paris in search of the material required to pursue his studies on muscular response to faradic current. A strange, sauntering, mariner-like figure—he came of a long line of seafaring people—he went from one Paris hospital to another, delving into case histories, carrying on offhand arguments with interns as well as physicians-in-chief. He was frequently laughed at for his pains, but he continued his chosen course and often followed interesting cases from hospital to hospital, even at his own expense. His ways were unconventional and often laid him open to suspicion and exposed him to snubs. However, his sincerity, his transparent honesty, and his unselfish devotion to science broke down opposition and in his later years, he received cooperation from influential physicians who gave him access to an enormous number of cases in the vast Parisian hospitals.[2]

Duchenne developed great skill in stimulating combined and isolated muscle groups in normal living men, in extremities which were rapidly dissected and stimulated after amputation, and in cadavers while they still retained their ability to respond to electric stimulation. But primarily Duchenne was a great clinical observer and his investigations were above all based on clinical observation.

In the preface to "Physiology of Motion," Duchenne wrote "I devoted about twenty years to this problem. The investigation was conducted with the help of electromuscular experimentation and clinical observation to determine the proper action which the muscles possess in life, their mechanism, as direct voluntary motors, or moderators, or synergistic factors to prevent abnormal motion, and finally, as forces which contribute to the normal position of extremities during muscular rest by the balance of tonic tension." The author expressed his purpose as a desire to satisfy his curiosity and to demonstrate living anatomy in man as described by older scientists. He was enormously surprised to find that the results of his electrophysiologic experiments were at odds with the reports of experiments made on cadavers. This discovery led to the undertaking of many years of observation and study, culminating in the publication of "Physiology of Motion Demonstrated by Means of Electrical Stimulation and Clinical Observation and Applied to the Study of Paralysis and Deformities."

This book, according to its translator, may be placed among the greatest books of all times, not because of its historical significance, but because it is an excellent record of the movements of the entire muscular system, investigated by one observer whose originality, perseverance, and genius gave him a deeper insight into the action of muscles than that of many of his predecessors and also that of many more modern research workers. Kaplan goes on to say that there are many scientific publications of the past which should be in the hands of special readers for various reasons, but there are others which, although written many years ago, can be considered modern and of practical value to today's practicing physicians.

The "Physiology of Motion" belongs to this latter group. It is clear and lucid, written in language comprehensible to the ordinary physician and to those uninitiated in mathematical thinking. While some of Duchenne's findings are seemingly not in complete harmony with subsequent findings and occasional discrepancies can be found, careful analysis and additional

1. Duchenne, G.B.A.: Physiology of motion. Translated and edited by E. B. Kaplan. J. B. Lippincott Co., Philadelphia, 1949.

2. Garrison, F. H.: An introduction to the history of medicine. Ed. 3, rev. W. B. Saunders Co., Philadelphia, 1922, pp. 690-692.

information have in the past often shown that Duchenne's conclusions were correct.

This book should be the object of continued study on the part of osteopathic physicians. For, as it was put by Andrew Taylor Still, "A normal image of the form and functions of all parts of the body must be seen by the mind's eye or our work will condemn us."[3]

PROGRESS IN OBSTETRICS

This month's JOURNAL is the obstetrical and gynecological number. Material for the Supplement contained herein was contributed by the American College of Osteopathic Obstetricians and Gynecologists. Probably the "reproductive" specialties are of greater general interest than any other of the specialties for surely obstetrics in itself engages the attention of a wide segment of the population.

That progress has been and is being made in the field is evidenced by the mortality statistics recently issued by the United States Public Health Service. The maternal death rate in the United States, which was formerly 6 per 1,000 live births and one of the highest in the world, has declined steadily since 1936. It was 4 per 1,000 live births in 1940 and only 1.1 in 1948. Infant mortality, which had been reduced to 47 per 1,000 live births by 1940, reached a new low of 31.8 in 1948.[1]

While improvement in environmental conditions, nutrition, and the general health of the population have undoubtedly played a part in the reduction of obstetric mortality and morbidity, the major part of the improvement has been the result of advances made by the healing arts profession in the care of mothers before, during, and after delivery.

An obstetric case begins with conception. That many pregnant women have learned this has increased the ability of physicians to help them. Indeed many women have come to realize the desirability of examination before becoming pregnant, thus allowing their physicians to detect and, in many cases, to correct conditions prejudicial to their own health and safety as well as that of expected offspring.

The physician who sees his patient at regular intervals during pregnancy is able to check the urine, blood pressure, and weight. He is able to auscultate fetal heart tones after the fourth month. He is able to inquire about nausea, vomiting, abnormal swelling, headache, constipation, undue nervousness—in short he is able to keep control of the situation and to take steps to relieve or to ward off serious complications. The osteopathic physician is generally able to administer manipulative therapy which immediately produces a feeling of well-being and relief from the aches and pains which frequently accompany pregnancy. He is able to correct postural disturbances. Prenatal osteopathic manipulative therapy leads to shorter labors and lessens the incidence of true eclampsia and pre-eclamptic toxemia.[2]

While it is obvious that perfect obstetrical analgesia and anesthesia are still to be discovered, it is equally obvious that much attention is being given the subjects and that great improvements have been made. Recognition of the injurious effects on the fetus has decreased the use or, at least, the dosage of various agents. Psychic preparation for labor has produced good effects in many patients and has aroused the interest of both doctors and patients. Spinal anesthesias, especially continuous caudal analgesia and saddle block anesthesia, have been effective in reducing pain. Their safety depends largely on their administration by adequately trained personnel.[3]

The prophylactic use of the antibiotics, notably penicillin and aureomycin, has produced favorable results. While the intramuscular administration of large doses of penicillin during parturition and early puerperium does not significantly lessen the incidence of intrapartum or 1-day fevers, it does reduce fevers of longer duration by approximately two thirds. Its use during long and difficult labors and in potentially infected patients seems indicated.[4] Aureomycin has been found to be a desirable agent because it is effective orally, it is effective against a wide range of bacteria, and it does not produce serious toxic manifestations.[5]

Any osteopathic physician has it in his power to render outstanding service to the obstetric patient. In addition to the advantages accruing from refinements of anesthesia, roentgenographic examination, knowledge concerning the Rh factor, the antibiotics, et cetera, the osteopathic physician is equipped to give manipulative care which physicians of other schools of medicine are not prepared to give.

Obstetrical care has been an important part of the osteopathic practice since its founding. Indeed, when securing the charter for the American School of Osteopathy, Dr. Still stated that a part of its purpose was "to improve our systems of . . . midwifery." In recent years the number of osteopathic physicians devoting all or most of their time to obstetrics and gynecology has become great enough for them to join together and create the American College of Osteopathic Obstetricians and Gynecologists, an active group working to keep its members abreast of the best developments, to aid the American Osteopathic Association in problems relating to the specialty, and to improve teaching and practice throughout the United States. It is to this group that the profession is indebted for the excellent papers which appear on pages 573 to 605.

3. Still, A. T.: Osteopathy: research and practice. Published by the author, Kirksville, Mo., 1910, pp. 40-41.

1. Annual Report of the Public Health Service, 1949. United States Government Printing Office, Washington, 1950.

2. Dooley, W.: Osteopathy's contribution to prenatal care. J. Am. Osteop. A. 46:6-7, Sept. 1946.

3. Mines, J. L., and Pinder, D. E., Side effects encountered with obstetrical conduction anesthesia. J. Am. Osteop. A. 49:242-246, Jan. 1950.

4. Keettel, W. C., and Plass, E. D.: Prophylactic administration of penicillin to obstetrical patients. J. Am. M. A. 142:324-328, Feb. 4, 1950.

5. Guilbeau, J. A., Jr., *et al.*: Aureomycin in obstetrics: therapy and prophylaxis. J. Am. M. A. 143:520-526, June 10, 1950.

Department of Professional Affairs

ALLAN A. EGGLESTON, D.O.
Chairman
Montreal, Canada

COMMITTEE ON SPECIAL MEMBERSHIP EFFORT

STEPHEN B. GIBBS, D.O.
Chairman
Coral Gables, Florida

OPEN LETTER TO MEMBERS

Dear Member:

The A.O.A. gained almost 100 members during the past year. While such a gain is good, membership is still way below what it should be. Every eight osteopathic physicians who are members still bear the burden of three others who are nonmembers. This is not fair. All members know nonmembers who are financially able and eligible to become A.O.A. members. They must be urged to join. Should they do so, both will profit.

To date less than 100 more dues have been paid than on the same date last year, although appeal after appeal has been made for payment. Why wait until the last minute to pay? Late payment causes unnecessary trouble and confusion for the membership committee and for Central office.

Pay your dues *now*. Keep your membership and your DIRECTORY listing and at the same time save work and expense for others. Bring in some new members.

Remember: *This is membership year!*

STEPHEN B. GIBBS, D.O.

MEMBERSHIP REPORT AS OF JUNE 1, 1950

Membership Count, May 1, 1950		7,761
Applications received in May, 1950	25	
Graduates licensed in May, 1950	11	
Restored to roll, May, 1950	3	
	39	
Deaths in May, 1950	9	
Gain in May, 1950		30
Membership Count, June 1, 1950		7,791

HONOR ROLL

Edwin J. Elton
Benjamin S. Jolly
Jacobine Kruze
Charles W. Vogler
H. R. Whalley

Department of Public Affairs

JOHN W. MULFORD, D.O.
Chairman
Cincinnati

BUREAU OF PUBLIC EDUCATION ON HEALTH

JOHN P. WOOD, D.O.
Chairman
Birmingham, Mich.

PUBLIC HEALTH LAWS ENACTED OR PROPOSED IN 1950

During the 1950 legislative year, twenty-one state legislatures met either in regular or special session. The states of Kentucky, Louisiana, Massachusetts, Mississippi, New Jersey, New York, Rhode Island, South Carolina, and Virginia met in regular session. The regular sessions of the California and Maryland legislatures were limited to budgetary matters and other special subjects. The legislatures of the states of Arizona, Connecticut, Georgia, Idaho, Maine, Michigan, Missouri, South Dakota, Texas, and Wyoming met in special session and were limited in their considerations to special subjects. During the coming 1950-1951 legislative year, forty-four state legislatures will meet in regular session.

A. PRACTICE ACTS

The New Jersey legislature enacted into law Assembly Bill No. 275, which amended the Medical Practice Act to permit persons holding a limited osteopathic license in New Jersey to take the examination for a license to practice medicine and surgery. A similar law had been enacted in 1939, but the period for taking the examination had expired on November 1, 1941. Applicants for examination must present evidence to the Board of Medical Examiners of completing either an internship of 2 years, of serving a 2-year residency in surgery or of completing a 2-year postgraduate course acceptable to the Board. Applicants presenting evidence of at least 3 years of practice in surgery acceptable to the Board may be admitted to the examination without other proof. The examination covers the subjects of pharmacology, therapeutics, and surgery. Osteopathic physicians with a limited license in New Jersey have until December 31, 1954, to take the examination for a license to practice medicine and surgery.

Virginia Senate Bill No. 181, which became law, clarifies the definition of the phrase "practice of osteopathy" found in the Medical Practice Act under which osteopathic physicians are licensed. The definition of "practice of osteopathy" was changed from "shall include the use of surgery or of drugs as the case may be" to "shall include the use of drugs and surgery." This amendment resulted from the demand of an osteopathic applicant for a license to practice only surgery after having failed the part of the examination relating to drugs.

The amendments proposed to the Osteopathic Practice Act by Louisiana House Bill No. 123 have been approved unanimously by the House and will apparently be passed by the Senate. The term "osteopath" will be replaced by the term "osteopathic physician" and the name of the Board will be changed from the "State Board of Osteopaths" to the "State Board of Osteopathy." These changes and others were recommended by the Louisiana State Osteopathic Society to the revisor of statutes who has been directed by the legislature to carry out a general program of statutory modernization and revision. These changes will make the Osteopathic Practice Act more susceptible to later amendments to enlarge the practice rights.

At the time of the last Annual Report of the General Counsel's office, Wisconsin House Bill 642A was being considered by the Wisconsin legislature. The amendments proposed by this bill were enacted into law so that osteopathic physicians and surgeons in Wisconsin may receive a license to practice "medicine and surgery." The license previously authorized the practice of "osteopathy and surgery."

New York Assembly Bill No. 2342, which was enacted into law, is also to be noted. This bill authorizes the Attorney

General to apply to the Supreme Court in the judicial district in which a violation of the law governing the practice of medicine, osteopathy, and physiotherapy is alleged to have occurred, for an injunction to restrain the commission or continuance of acts in violation of the law. This remedy was also made available to prevent violations of the law relating to the practice of dentistry, podiatry, ophthalmic dispensing, and optometry.

It is of interest to note that Georgia House Bill 600 has become law. This act provides for the creation of an independent Board of Naturopathic Examiners and provides for the issuance of a license to practice naturopathy. Naturopathy or natureopathy is defined as "that philosophy and systems of the healing art embracing prevention, diagnosis, and treatment of human ills and functions by the use of several properties of air, light, heat, cold, water, manipulation, with the use of such substances, nutritional as are naturally found in and required by the body, excluding drugs, surgery, x-ray and radium therapy, and the use of x-ray equipment." Nothing in the act is to affect persons licensed to practice osteopathy in the state of Georgia. A bill (New York Assembly, 2941) to establish a Naturopathic Board in New York was also introduced, but was not passed.

Bills were introduced in the states of New York (N.Y.A. 1414), New Jersey (N.J.A. 168), and Massachusetts (Mass. H.B. 1457) to create boards of chiropractic examiners, but failed to pass the legislature. Missouri House Bill 2071 resulted in minor amendments to the Chiropractic Act of Missouri.

Bills were introduced in the states of New York and New Jersey for the creation of a State Board of Examiners of Psychologists, but were not passed. The New Jersey bill (Assembly, 373) would require applicants to hold a "doctorate in psychology from an educational institution approved by the licensing board," and to have had at least 1 year's supervised experience under a licensed psychologist or neuropsychiatrist or other experience deemed satisfactory by the board. In the past few years, bills have frequently been introduced into the legislatures of the various states in an effort to secure recognition and to establish definite qualifications for the practice of psychology.

B. FACILITIES FOR MEDICAL CARE

The legislatures of the various states are becoming more aware of the need for adequate hospital facilities for medical care. Particular emphasis was given to this problem by the governors of the states of New York, California, Mississippi, Texas, and Vermont in their addresses to the legislatures. Special attention has been directed to the conditions prevelant in mental hospitals. New York has projected an eighty-three million dollar construction program for the development of better physical facilities for the mentally ill. A twenty million dollar hospital construction program was proposed in California for the expansion of mental hospitals or institutions in that state.

Kentucky, which was one of the few states which had not adopted a hospital licensing law, passed Kentucky Senate Bill 179, which defines the term "hospital" and establishes a system of hospital licensing. Two years is allowed for a hospital to conform to the minimum standards established by the law, but after this period no hospital may be operated without a license issued by the State Board of Health. The minimum standards which relate to cleanliness, safety, and sanitation are written directly into the law and are of such a general nature as to make them acceptable to all branches of the healing art. The law provides for the organization of a Hospital Council which is to assist the State Board of Health in making the necessary rules and regulations for the administration and enforcement of the law.

In South Carolina, the legislature passed House Bill No. 2257, which appropriated county funds for the purpose of constructing or enlarging facilities of certain community hospitals upon the condition that the respective townships of such hospitals matched the funds appropriated. House Bill 1420, which provided for the establishment of a hospital for alcoholics, was also introduced into the South Carolina legislature, but only passed the House. Bills have been introduced in other states and commissions established to study the problems concerning the availability of hospital facilities for medical care with special emphasis being placed on facilities for the care of persons suffering from specific diseases, such as tuberculosis, alcoholism, cerebral palsy, etc.

C. AVAILABILITY OF MEDICAL CARE

1. *Public Health Departments.*—The state of New Hampshire passed House Bill No. 1-X, known as the Reorganization Act of 1950, which resulted in certain changes in the executive and administrative departments of the government. The law requires the transfer of the Board of Registration and Medicine to the Department of Health, although the Board will continue to function as a separate organization or entity with all the powers and duties which it previously possessed. The bill as amended provides for the appointment of three physicians to the State Board of Health, whereas only two were previously appointed.

South Carolina enacted Senate Bill No. 463 and House Bill 2308, which authorized the creation and maintenance of a County Board of Health in the counties of Lancaster and Salada. The creation of a County Health Department is also permitted. These bills were passed apparently in accordance with the policy pursued in several states to secure the establishment of County Health Departments since the City Health Departments have not been adequate to insure sanitary conditions throughout the county.

2. *Special Diseases or Illness.*—Problems relating to the care and treatment of the mentally ill continue to receive the attention of the various state legislatures. The Michigan legislature, by Senate Concurrent Resolution No. 14, established an interim committee to study the mental health problems and to develop a state mental health program. A similar committee was proposed in Massachusetts. Connecticut Senate Bill 27 proposed the establishment of a State Mental Health Department. Virginia Senate Bill No. 235 was enacted, which amends the law relating to the admission, care, and treatment of the mentally ill, provides for the admission of the mentally ill to state or private institutions. The general commitment procedure requires the examination and certification by two physicians, one of whom "when practicable is to be the physician of the person who is alleged to be mentally ill, epileptic, mentally deficient, or inebriate, and neither shall in any manner be related to him or have any interest in his estate." This law is important, for it preserves the right of the family physician to participate in the commitment procedure in contrast to the laws proposed or enacted in other states limiting the right to examine and certify to specialists certified as psychiatrists. Bills were introduced in the state of New York to improve the standard of care of the mentally ill by the establishment of minimum standards for staffs needed in the operation of state mental hospitals.

The Michigan legislature has provided for the creation of a special interim committee to investigate the establishment of an equitable basis for state payment to hospitals for services rendered to crippled and afflicted children. The committee may also consider other problems related to the development of the Crippled and Afflicted Children's Health Program in Michigan. The state of Maryland increased the amount which it would appropriate for the care, education, and treatment of the mentally and/or physically handicapped children from four hundred dollars to six hundred dollars per child.

Further attention was given by several of the state legislatures to the problem of alcoholism. Maryland passed Senate Bill No. 2, which created an unpaid commission on alcoholism and authorized the annual expenditure of one hundred thousand dollars for the establishment of clinics for the treatment of persons afflicted with alcoholism, especially chronic alcoholism. Persons who are financially able to contribute to the cost of such treatment may be compelled to make such payments as are determined by the commission. Mississippi enacted Senate Bill No. 118, which provides for the commitment and detention of alcoholics and drug addicts for treatment. Provision is made for the commitment of alcoholics or drug addicts by a similar procedure as is followed for the commit-

(Continued on page 607)